



## **Mémoire de stage**

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Sujet:

**Cooperation for Smallholder forestry:**

**A scoping study on planted forests of Cameroon's NorthWest  
region**

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# ABSTRACT

In response to an increasing demand for wood products and environmental services and a decrease of forest resources, wood must be provided by planted forests. In Cameroon's North West region, smallholder (SH) plantations largely contribute to wood production, but various interest groups compete for space in the densely populated area. This study identifies the most important actors in wood production and promotion of tree planting as well as their respective motivations. Their different approaches and current and possible cooperation are characterised. Data collection involved 25 interviews and 90 questionnaires. SHs play a key role in the current forestry sector and in efforts to increase wood production and tree planting. Their interest to involve in forestry is constrained by scarcity of land and funds, and the prioritisation of agriculture. Profitability of wood production is reduced by market constraints and taxes. Public services and civil society organisations are promoting tree planting, but administrative structures and competition between actors undermine their efforts. Cooperation between actors could promote the forestry sector, but requires the formulation of common objectives and networking. Priority areas for cooperation are information exchange, supply of seedlings and funding mechanisms.

# RESUME

En réponse à une demande croissante de produits ligneux et services environnementaux et la diminution des ressources des forêts naturelles, plus de bois doit être fourni par des forêts plantées. Dans la région du Nord-Ouest du Cameroun, les plantations des petits propriétaires (PP) contribuent largement à la production de bois, mais il existe une forte compétition pour les terres entre divers acteurs. Cette étude identifie les acteurs les plus importants pour la promotion du secteur forestier ainsi que leurs motivations respectives et caractérise leurs différentes démarches et coopération. La collecte de données impliquée 22 entrevues et 90 questionnaires. PP jouent un rôle clé dans le secteur forestier comme dans les efforts pour accroître la production de bois et la plantation d'arbres. La motivation des PP de s'engager dans la foresterie est réduite par un manque des terres et des fonds, et leurs préférences de l'agriculture. Pour les PP, la rentabilité forestière est réduite par les contraintes du marché et les taxes. D'autres acteurs ayant des capacités et des origines distincts s'engagent dans la promotion de la plantation d'arbres, mais des structures administratives et la concurrence entre eux sapent leurs efforts. Une coopération pourrait promouvoir le secteur forestier, mais exige la formulation des objectifs communs et la création des réseaux. Les domaines prioritaires de coopération sont l'échange d'informations, la fourniture des plants et des mécanismes de financement.

# TABLE OF CONTENTS

1. <b>INTRODUCTION</b> .....	1
2. <b>PROBLEMATIC</b> .....	3
2.1. Task.....	3
2.2. Analysing the task to create a problematic .....	4
2.3. Position regarding the task.....	4
2.4. Theoretical framework.....	5
3. <b>MATERIAL AND METHODS</b> .....	6
3.1. Site description.....	6
3.2. Data collection .....	8
3.3. Data analysis.....	12
4. <b>RESULTS AND DISCUSSION</b> .....	13
4.1. How is wood produced ?.....	13
4.1.1. Ownership structure .....	13
4.1.2. Wood resources and spatial structure of forests .....	15
4.1.3. Management.....	19
4.2. Actors and objectives.....	23
4.2.1. Smallholder livelihoods and tree planting.....	23
4.2.1.1. Vulnerability context.....	23
4.2.1.2. Smallholders' motivation for forestry and tree planting.....	26
4.2.2. Objectives and Strategies of other planting actors .....	32
4.2.2.1. Council Strategy .....	32
4.2.2.2. CSO Strategies.....	33
4.2.3. Objectives and Strategies of non-planting actors .....	33
4.2.3.1. ANAFOR Strategy .....	33
4.2.3.2. MINFOF Strategy .....	35
4.2.3.3. Other Ministries' Strategies .....	36
4.2.3.4. Government Strategy .....	36
4.2.3.5. Sonel's Strategy .....	37
4.3. What processes and leverage points ? .....	38
4.3.1. Structures and processes that impact Smallholders' strategies.....	38
4.3.2. Possible cooperation to increase effectiveness of reforestation efforts .....	47

4.3.3. Trajectories .....	55
4.4. Reflective statement .....	56
5. <b>CONCLUSION</b> .....	<b>57</b>
6. <b>REFERENCES</b> .....	<b>58</b>
7. <b>ACRONYMS AND ABBREVIATIONS</b> .....	<b>61</b>
8. <b>TABLE OF TABLES</b> .....	<b>61</b>
9. <b>TABLE OF FIGURES</b> .....	<b>61</b>
10. <b>ANNEXES</b> .....	<b>62</b>
10.1. Table of annexes .....	62
10.2. Annex 1: Interview guide for semi-structured interviews .....	63
10.3. Annex 2: Household questionnaire .....	70
10.4. Annex 3: Transcripts of semi-structured interviews .....	78
10.4.1. Table of semi-structured interviews .....	78
10.5. Annex 4: Except from the analysis of questionnaire data .....	136

# 1. INTRODUCTION

The increasing demand for forest products around the world on the one hand and the reduction of forest area on the other hand make the importance of planting trees evident (FAO, 2010). Demand for wood needs to be met by production, otherwise it will lead to further deforestation and the destruction of natural forests.

Worldwide, forests contribute to the livelihoods of at least 1.6 billion people (WB, 2004) and provide environmental services like biodiversity, soil conservation, water and climate regulation and play an important role in the mitigation and adaptation to climate change (FAO, 2010; UNFCCC, 2008; IPCC, 2007).

Planted forests are designed by human beings and therefore have the potential to better fulfil some specific human needs, than would the same area of natural forests. Therefore plantations may be better suited to face an increasing anthropogenic demand for specific forest products (Pye-Smith, 2003).

The benefits of plantations are, however, not unconditional. A replacement of natural forest with plantations will usually result in a reduction of biodiversity and often other environmental services. In order to avoid a loss of natural forests through the establishment of plantations, they may be created in areas that have been strongly modified by humans and contribute less to the provision of environmental services than natural forests (anthropogenic landscapes) (Ellis, 2006; Pye-Smith, 2003). Tree plantations in anthropogenic landscapes may compete with other land uses, especially agriculture (Pye-Smith, 2003). This is especially the case for large plantations. In contrast, decentralised production of wood, by small rural subsistence farmers (smallholders) requires decision making processes on local or even household (HH) scale about where resources can be grown and what mix of species best suits the needs of the planter. This increases the efficiency of plantations by minimising their interference with other needs of the planter (Gauthier, 1992).

Research on decentralised or smallholder (SH) wood production is particularly important in situations, where several factor complexes influence their outcome. High competition for land and consequent low availability can create conflicts between landholders and even within HHs about how to use the scarce land. Governments may envision a different role of trees than SHs would and interfere into social dynamics with policies and legislation or the use of public servants. Apart from the government, other non-planting actors, such as civil society organisations (CSOs) may also wish to influence the development of land use and direct their capacities towards their individual goals.

Together these factor complexes set the scene for many interactions that will finally determine the role of trees and their integration into the landscape.

In populated areas, trees can only persist, if they represent a benefit to those that have immediate control over them. This means that any planted or deliberate retained tree is part of its owner's strategy to increase his or her well-being. This raises the question about what these different strategies may be, how they contribute to increasing well-being and which factors contribute to choosing strategies that involve trees.

At the same time, the decision on tree planting does not only depend on household (HH) specific factors, because public institutions can strongly influence this decision; modifying the HH's situation and available means either directly through policy and services or indirectly through their existence, structure and functioning.

Additional to planters and government agencies, there may be a number of other actors and groups pursuing their specific interests in the context of tree planting without engaging in it themselves. The multitude of different interests may often compete, so that the total contribution of non-planting actors to planting efforts may be less than the sum of their efforts. The search for synergies between actors may render their efforts more efficient with respect to a common goal.

Although the problematic may apply to only some rural areas in developing countries as many lack at least one of the components mentioned above, it is especially important for the many cases where landscapes and societies are evolving towards this situation, representing a possible future scenario.

Cameroon has displayed high political stability over the last decades especially in comparison with other Central African states. Legislation, policies and administrative structures can therefore be considered relatively advanced. Although vast areas of Cameroon's surface are still forested, some regions have experienced large scale deforestation already some decades ago. Especially the highlands have attracted settlers and have largely been transformed into a densely populated agricultural landscape. In response to poverty, inequality and agricultural crises, especially the NW region has seen the formation of many civil society organisations (CSOs). Therefore the NW region is a suitable area to study tree planting and wood production in an anthropogenic landscape and its dynamics regarding actor involvement, impact and extent of planted forests.

In the face of data shortage on these dynamics, a research approach would need to characterise the existing modalities of tree planting and wood production and then target the multitude of factors that impact these activities. Therefore the objective of this study is to characterise the wood production and tree planting dynamics by identifying the current state of forests, relevant actors and leverage points to increase efficiency of efforts that promote tree planting for the benefit of the local population, acknowledging its multiple and varying needs. More specifically the study will focus on the ownership, spatial structure and management of forests in the NW, the objectives and strategies of planters and other actor groups as well as on identifying fields of current and potential cooperation. The study wants to

verify whether or not smallholders (SHs) play a decisive role in tree planting and wood production, whether or not the diverging objectives of active actors and actor groups impede the development and adoption of sustainable forestry and whether or not there are leverage points to make reforestation efforts more effective especially through the cooperation of actor groups.

The result section of this document will provide an overview of forestry in Cameroon's NW region, highlighting the importance of SH forestry to then focus on this aspect in greater detail. Putting wood production in the context of the SHs' livelihoods will highlight the advantages and downsides for SHs and mention requirements to engage in this activity. Extending the scope for other factors that influence planting and wood production of SHs, relevant actors and their roles will be introduced. Finally, their interactions and roles are regarded under the aspect of possible cooperation.

## 2. PROBLEMATIC

### 2.1 Task

The main task for my internship at CIFOR's office for Central Africa was to conduct a scoping study about Cameroon's NW region, developing key aspects and potentials for further research regarding the stated objectives and priorities of the CIFOR.

The Centre for International Forestry Research (CIFOR) is a non-profit, global research organisation with the goal of facilitating informed decision making on land-use that concerns forests in developing countries.

CIFOR is part of a research consortium of several research organisations on forests, biodiversity, agriculture and development called Consultative Group on International Agricultural Research (CGIAR). CIFOR's research priorities as outlined in the CGIAR Research Program on Forests, Trees and Agriculture (CRP –FTA) (CGIAR, 2011) are:

- “1. Smallholder production systems and markets
2. Management and conservation of forest and tree resources
3. Landscape management for environmental services, biodiversity conservation and livelihoods
4. Climate change adaptation and mitigation
5. Impacts of trade and investment on forests and people” (CGIAR, 2011, p. xxi-xxii)

In its role as global research organisation, CIFOR's vision is to contribute to the acknowledgement of forests and their importance for livelihoods, climate and ecosystem and their inclusion in international political agendas. National and international “decision-making that affects forests is [to be] based on solid



science and principles of good governance, and reflect the perspectives of developing countries and forest-dependent people” (CIFOR, 2008, p. 11)

## 2.2 Analysing the task to create a problematic

The thematic direction from which to approach the study was chosen in order to yield the greatest potential to capture the various dimensions of CIFOR’s research priorities. The NW region is, apart from the francophone West region, unique in its topography as well as its characteristic of hosting significant areas of planted forests. Planted forests in the tropics are often large scale industrial plantations (Pye-Smith, 2003), which is not the case for the NW region and raises the question of the underlying motivations and processes behind tree planting. Currently there is little data available on these issues. Concerning the research priorities of the CIFOR, the plantation of forests or their management could contribute to climate mitigation (IPCC, 2007; UNFCCC, 2008) (area 4). Planted forests can contribute to climate change adaption by providing ecosystem services, which can, however, create trade-offs between environmental and economic or development interests (IPCC, 2007; UNFCCC, 2008) (areas 3 & 4). Including SHs into forestry activities and increasing their outcomes from forest activities can improve their livelihoods and reduce or prevent poverty (area 1) (CGIAR, 2011). Research on the relationship of their livelihoods with forestry includes an analysis of market and trade environments that impact the sector and consequently the benefits for SHs (area 5). At the same time, modalities of wood production influence how, how much and how long SH can profit from forestry activities (area 2). Therefore, the thematic approach to the study will be centred on the modalities of wood production, the actors involved in this activity as well as their motivations. The existence of significant SH production regimes in the NW demands and provides the opportunity to give this aspect particular attention. Data needs relate to the specific factors that shape SHs forest management decisions and to ways that increase their benefits from forest related activities. In this context, the aspects of efficiency and sustainability of the production are essential and encompass issues such as institutional arrangements, tenure, value-addition, equitable access, political processes and others. This study aims to answer if and to outline how these issues impact SH’s wood production in Cameroon’s NW region.

## 2.3 Position regarding the task

My position regarding the task is strongly influenced by the concepts and priorities that the CIFOR is using in the conception and implementation of their research. This includes the concept of a people centred approach, which however does not come at the cost of the environment, sometimes called “strong sustainability”, as opposed to “weak sustainability” that postulates that economic benefits can outweigh losses in environmental and social disadvantages (Ayres, Bergh, & Gowdy, 1998).

As opposed to studies that see fundamental scientific groundwork, e.g. in the field of anthropology, as a means in itself, CIFOR is strongly committed to achieving impact. Certainly the distinction is not clear, as CIFOR is in fact doing fundamental scientific groundwork in many areas, but its objective to inform

policy and practices highlights the need for results that can form the basis of decision making. In this regard, I perceive the purpose of this study to be a contribution to coordinated research that aims to improve human well-being, environmental conservation and equity in a conceivable time horizon, using a set of widely acknowledged concepts and priorities to allow high impact. This still includes the acknowledgement and highlighting of the role of factors that impact aspects beyond CIFOR's priorities. The intensity in which these may be studied and analysed may represent the amount of bias introduced by embracing the mentioned priorities. In this, bias would be owed to the focus of the study, because the adopted approach does not exclude explanatory variables a priori, but on the contrary prioritises issues as a function of their importance for the SHs.

## 2.4 Theoretical framework

For this study, I used an inductive approach assessing the information availability in the field with respect to the different research priorities of the CIFOR and circled in on the role and modalities of SH tree planting and wood production, because this group represents a research priority of the CIFOR in itself and plays a key role for the other priorities by being the central actor group facilitating forestry and wood production. To reflect their importance, the Sustainable Livelihoods Framework (DFID, 1999) was taken as a basis for the formulation of a theoretical framework. Given the nature of the study and the broad focus implied in it, the livelihoods (LH) of people were assessed with special focus on their involvement in forestry activities and the study only provides a static image of their livelihood (LH) situation. For this reason the LH outcomes and their respective influence on the assets of a HH are not included in the LH analysis. Instead, LH strategies, especially those that include involvement in forestry are used to explain the choices and constraints of SHs. The theoretical framework of this study will regard the socio-economic and physical context in which SHs live, differentiating two external complexes of factors that influence HHs. The first is the so-called vulnerability context that is to characterise the “external environment in which people exist” and that they are unable to influence on the scale that it affects them, e.g. population growth (DFID, 1999). The vulnerability context mainly restricts a HH's assets or their ability to transform one asset into another. The second complex is the combination of structures and processes, that shape HHs' assets, as well as their strategies and even influences their vulnerability contexts. Structures represent the institutions and organisations (government, associations, private) that can affect HHs in a variety of ways e.g. by creating and implementing policy or other customary rules, providing services, trading, etc. Structures are the infrastructure for processes. Processes in turn “determine the way in which structures- and individuals- interact.” (DFID, 1999). On the one hand that means that processes reflect the results of cooperation between the elements of the structures, but they may conversely also influence their cooperation. This can take many different forms from power

**Definition:** Assets represent the capital that a HH can use to shape their livelihoods by engaging in certain activities. Assets comprise of 5 categories : Human capital, Natural capital, Financial capital, Physical capital and Social capital (DFID, 1999)

relations inside a village to policies on inter-ministerial cooperation. On the other hand, processes determine the way and extent that structures influence SHs.

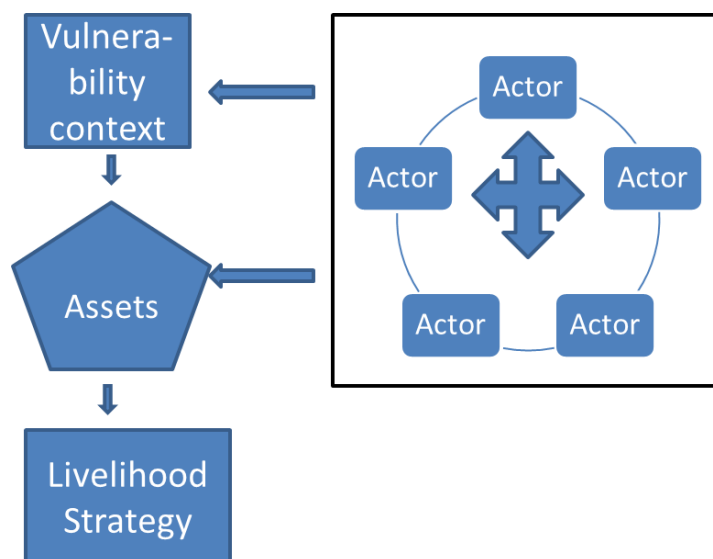


Figure 1: Simplified graphic of the adapted Sustainable Livelihoods framework. Structures and processes (box on the right) modify SHs access to assets and the context of their livelihood, thus influencing their livelihood strategies. Graphic modified from DFID, 1999.

After characterising wood production in the NW (Results (4.1)) this study will describe the vulnerability context of SHs in the NW, its influence on HHs' assets and characterise their strategies (Results (4.2)). Following this, the different actors will be introduced, characterising the way they impact SHs. Finally their current and possible interactions will be analysed and discussed (Results & Discussion (4.3)).

## 3. MATERIAL AND METHODS

### 3.1 SITE DESCRIPTION

The NW region is a mountainous region that forms part of the Cameroon range, a line of volcanic mountains that stretch from the islands in the Gulf of Guiney inland for 600 km in north-eastern direction. It is located about 700 km north of the equator and 250 km north east of the Gulf of Guiney in the Atlantic coast (Google, 2013). Elevation is between 900 and 2 000 m above sea level and precipitation is around 1800-2100 mm per year (Climate-Data.org, 2013). There is one distinct dry season from November to March and moderate precipitation during the rest of the year. The NW region is divided into 7 administrative parts called divisions, each with several sub-divisions (Ingram, Diestelhorst, & Ntiabang, 2007).

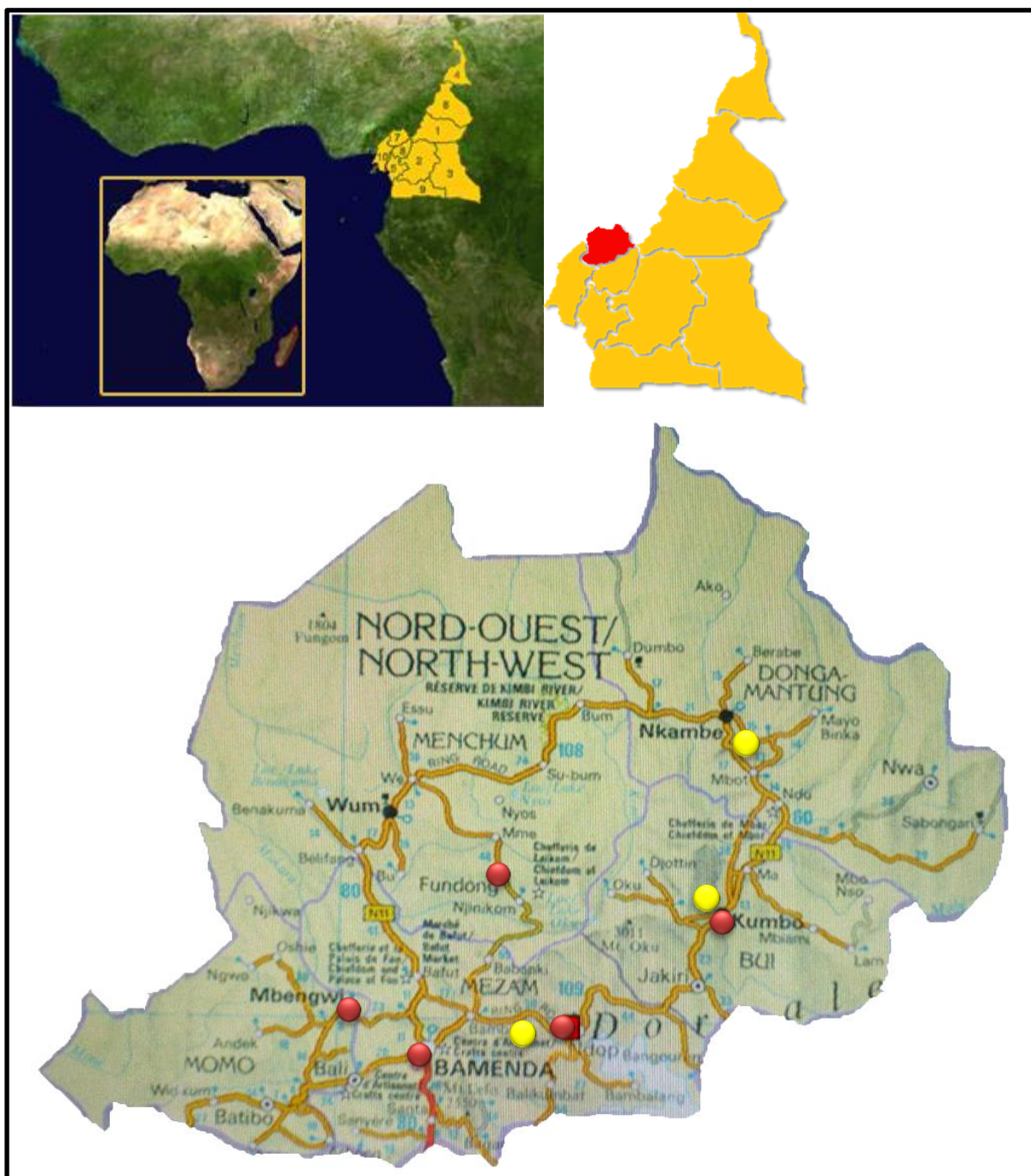


Figure 2: Upper left: Cameroon's location in Africa (NASA, not copyrighted), Upper right: The NW region within Cameroon (Noyes & Smithson, 2004). Below: Study sites; SSIs (red) and questionnaire surveys (yellow). (Modified from Frankyboy, 2007)

The relatively fertile soils of the NW region have permitted a strong population growth and a high population density. As a consequence of agricultural activities and urbanisation, forest areas were largely reduced. At the same time, population growth was not matched by economic development and currently 70% of the population are engaged in crop production for subsistence. The NW has neither significant natural resources, nor industry and is now the second poorest region of Cameroon. This results in migration to bigger towns inside and outside the NW. The road network is developed relatively well in

comparison to other regions, but of varying quality, decreasing especially with increasing distance from the regional capital Bamenda (800 000 habitants).

There is a large number (>11 000) of civil society organisations (CSOs), such as common initiative groups, cooperatives, etc. in the NW, concerned with agriculture, livestock and forestry (90%) as well as women's rights, health and education. Additionally there are many Non-governmental Organisations active in the same fields (Ingram, Diestelhorst, & Ntiabang, 2007). NGOs often represent somewhat larger organisations that are also subject to a different process of legal recognition than common initiative groups or other associations or organisations, often with the same or somewhat broader objectives than CSOs. Notwithstanding this difference, this whole group will be referred to as CSOs in the following.

Traditional rule is held by chiefs and subsidiary chiefs and is still important regarding conflicts, especially on land.

Habitats range from sub montane- over montane forests up to subalpine grasslands. The region contains the largest remaining parts of afro-montane forests in West-and Central Africa (Kilum Ijum forest) (Ingram, Diestelhorst, & Ntiabang, 2007) as well as important areas of sub montane forests, especially at the border to Nigeria. Both forest types display high endemism and human pressure alike (SSI 5; see Annex 3 for transcription of semi-structured interviews (SSI)). Most other forests have vanished in the face of human settlement, giving way to agriculture and especially pastures or have been heavily fragmented. Strongest impacts on forests have been achieved within the last two centuries, with large scale deforestation. Although humans have been altering the forests of the NW for many centuries, remaining forests of native species are still considered natural (also throughout this study).

### 3.2 DATA COLLECTION

For data collection I used a mixed methodology (Creswell, 1994) of semi structured interviews (SSIs) (see Annex 1 for questions and Annex 3 for the transcripts of the interviews) and a HH survey (see Annex 2).

The SSIs included a broad range of questions about the development of tree planting and the extent of forests, specific practices, actors and cooperation, motivations and processes and mechanisms of control and supervision that influence tree planting and forestry activities (see Annex 1). The purpose of the SSIs was to get an insight into the structures and processes that form the context of forestry in the NW region. All interviews were recorded on tape and later transcribed paraphrased.

The choice of respondents aimed to represent all large actor groups, which were identified as officials and employees of public services, including councils, CSOs, middlemen and private planters. Maintaining equal ratios of sampling intensities for the different actor groups proved difficult due to the reliance on key informants from public services for the definition of these actor groups and also for the identification of planters that have not been in contact with these services. Even in the field, a strong constraint and

bias was introduced by the request of the “Agency for the support of Reforestation” (ANAFOR) to interview SH that participate in their program only in the presence of an ANAFOR employee. In general, there were strong constraints due to the unavailability of respondents in all actor groups. The opportunity to talk to officials usually depends on prior established contacts or recommendations by colleagues or trustees. For me this presented a trade-off between avoiding bias and finding respondents willing to answer questions without prior authorisation from their superiors (as this process takes a lot of time). This problematic occurred several times. In general, people were reluctant to talk about money and the government, both out of the fear of taxation or disadvantages.

In the SSIs my posture towards respondents involved a confrontational approach. However, controversial questions were asked preferably at the end of the interviews, so that the greatest part of interviews rather had an inclusive atmosphere.

The geographic scope of the SSIs was limited to 4 divisions of the NW. Regional offices of public services were interviewed in Bamenda, SHs, public servants, CSOs and communal officials mostly in and around the divisional capitals Mbengwi, Fundong, Ndop and Kumbo.

### ***Household survey***

The HH survey intended to capture information about tree planting motivation and factors that influence it. All SHs are part of a HH, but not all of the HHs are home to SHs, because some people may not have access to land at all and make a living from wage labour, or do not use any of their land for subsistence and can therefore not be considered SHs. It was important to conduct a HH survey, because it can provide quantitative data and detailed, differentiated information on the choices of HHs. It provides the opportunity to compare HHs and different groups in a more quantitative way, as the questions are formulated the same way for each respondent and not context specific like in SSIs. This quantitative information cannot be provided by key informants or anyone else than the HHs themselves.

The questionnaire was comprised of questions about the HH members, their experience with tree planting, motivation to plant, the different patches of land they use, products they harvest and sell, as well as their expectations of the future (Annex A). The sample size was 90 HHs with subsamples of 30 HHs in each village.

### ***Target population***

The target population was chosen as all rural HHs of the NW region. This is obviously a very broad category, and results of a HH survey will not represent all different types of rural HHs, but they will be applicable very broadly, in contrast to focussing on a specific group, e.g. educated Muslim farmers. This broad focus applies also to the questions asked, so that more aspects of the population can be captured. With its broad thematic design the survey can also serve as pre-survey to define sampling intensity for other surveys.

### **Sampling strategy:**

The sampling strategy included a selection of sub-groups in order to gain variation in data. Stratification of the sampling area was a function of distance of the villages to Bamenda, their distance to a tar road leading to Bamenda and the population density of their division. The Menchum division had to be excluded from the sample area due to logistic concerns (distance, rainy season). The process of village selection included several steps.

First, I detected and marked all villages in the sample area using Google maps (Google, 2013). I calculated the distances of each village to Bamenda and to the tar road leading to Bamenda using Google maps. I assigned all villages to one of 3 groups according to each of the following variables; distance to Bamenda, distance to the tar road and another variable calculated as a weighed sum of these distances, giving mud road a higher weight (factor 2.5) on the basis of observed mean road speeds. Some outliers were removed.

In order to include only villages that were representative of their group, I excluded all villages that lay outside the standard deviation of the mean for each group. I assigned each division of the NW to one of 3 groups, according to their rural population density. I calculated the final group (=stratum) for each village as the average of the other 4 group assignments with 1-1.3 =group 1; 1.5-2=group 2; 2.3-3= group 3. I chose the limits for rounding after a visual assessment of the distribution of final group values aiming for homogenous groups. Randomly choosing one village from each of the final groups provided the final sample.

The exclusion of the least populated division as well as the removal of outliers has certainly introduced bias towards more agricultural and populated areas. Remote areas probably represent distinct conditions from the ones studied and therefore another “group” that should be included in following studies.

The three villages that were chosen for questionnaire administration are situated in the Ndonga Mantung, Bui and Ngo-Ketunja divisions at distinct distances to Bamenda. Bamessing lies in the Ngo valley and is characterised by strong agricultural and especially rice production. It is connected to Bamenda by a good tar road. Kikaikom is situated next to the divisional capital Kumbo (ca. 80,000 inhabitants), in a mountainous landscape of agriculture, pasture and forests. It is connected to Bamenda via a tar road that is interrupted by mud road on some stretches. Binka is situated in a similar landscape as Kikaikom, but it is connected to the closest city Nkambe (ca. 10,000 inhabitants) and Kumbo only by mud road.

Table 1 : Coordinates of study sites for questionnaire surveys. Source: Google Maps, 2013

Village Name	Latitude	Longitude
<b>Bamessing</b>	5°59'4.94"N	10°21'37.62"E
<b>Kikaikom</b>	6°14'38.31"N	10°39'37.85"E
<b>Binka</b>	6°32'20.16"N	10°46'23.25"E



### **Sampling size:**

The sample size of 30 HH per village is very small given the huge target population of rural HH of 1,000,000 (INASTAT, 2012). However, expectations of statistical significance are low as the survey was aiming for the general trends and not to provide data for a multiple regression analysis. Information from the SSIs suggested that the population is relatively homogenous within regions, which should reduce the sampling error. In the decision for 3 villages with 30 HHs, the goal to capture variation between villages clearly outweighed concerns of accurately representing the population of each village.

### **Household selection:**

The sampling frame in each village included all HHs. I randomly selected the sampling units, using satellite images in which all houses with tin roofs appear (see Figure 3). I grouped multiple houses that apparently formed a compound and counted them as one HH. I numbered all houses or compounds and drew a random sample of 30 from the number of HHs in the village. Each selected number could be assigned to a house or group of houses without ambiguity. In the field, we replaced abandoned houses with the next closest house and not with another randomly selected house due to time constraints. Not all houses have tin roofs and consequently did not fall into the sampling frame, but observation in the field showed that “tinless” roofs make up only 1-2%. The bias to exclude poor families does not apply as houses without tin roof usually form part of a compound with houses that have tin roofs. A more important bias might have been introduced via compounds that were not noted as such and not grouped. This would mean that the selection probability of a HH was proportional to the number of houses it has. Although most rich families tend to build rather larger houses than many, a failure to group houses to compounds could have introduced a bias towards excluding poor HHs. Exclusion of HH due to errors in numbering is not impossible, as the grouping of houses prohibited mechanisation of this task.

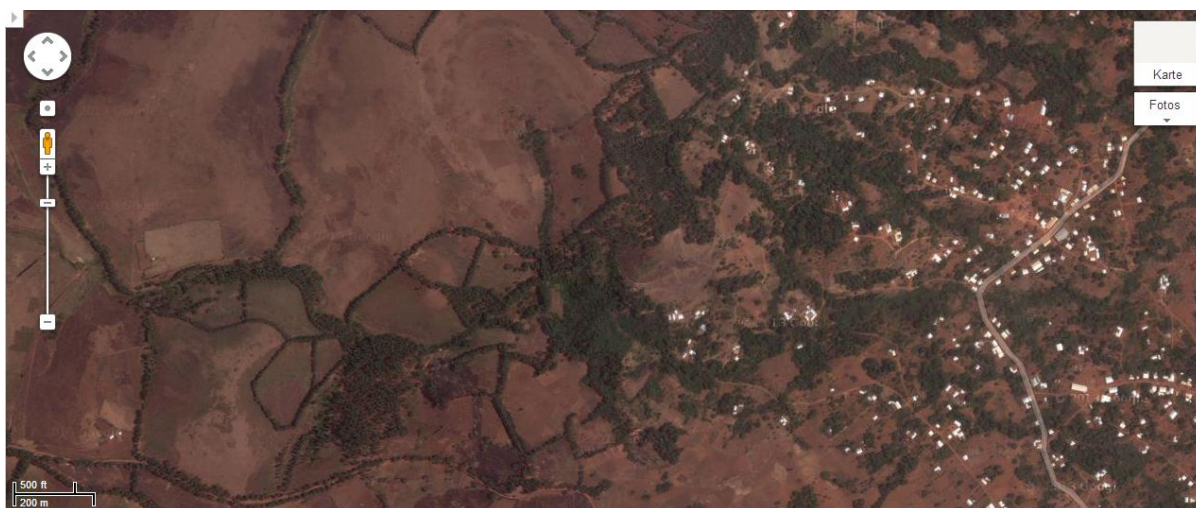


Figure 3: Satellite image of one of the study areas (Kikaikom). Houses that entered into random sampling of respondent households appear as white dots. (Google Maps, 2013)



**Data quality:**

Questionnaires were administered by 2 assistants and me. Training of the assistants involved practicing the questionnaire in role play and identifying and reacting to difficult situations. All respondents received an introduction, presenting the purpose of the study, explaining the importance of truthful answers, guaranteeing anonymity or explaining the role of CIFOR and its independence from the government, etc. (see Annex A). Respondents received a piece of soap, 2 pens and some CIFOR info material as small token of appreciation. We reviewed the questionnaires for missing data while still in the field.

**3.3 DATA ANALYSIS****Questionnaire**

I entered the questionnaire data in Microsoft Excel, using continuous codes for all responses in one questionnaire. Data entry to each cell was restricted to the possible answers for the corresponding question. Both of these practices aimed to avoid mistakes in data entry. In order to facilitate the analysis I recoded the data to non-continuous codes and transferred them to IBM SPSS. Analysis involved mainly descriptive statistics and cross tabulation.

**SSI**

Coding of SSI data involved two steps. In a first step I coded responses to thematic aspects that remained very detailed, cautious not to take information out of context, so that often the same information was assigned to several thematic aspects. In a second step, I recoded the responses according to interpretation and triangulation with information by other respondents and results from the questionnaires. New categories emerged and data was interpreted and triangulated according to these categories. Finally the categories included the respondents' positions (if available) and were included, following the structure of the results section.

**Triangulation**

The combination of the different methods to obtain results under the same research question was to reduce weaknesses and biases of each one of them. Also within one method, it was used to test respondent information. Triangulation was to provide a higher reliability of the results and highlight issues, where results from different methods contradict each other (Creswell 1994).

## 4. RESULTS AND DISCUSSION

### 4.1 HOW IS WOOD PRODUCED?

#### 4.1.1 Ownership structure

In contrast to other regions of Cameroon, planted forests in the NW play a paramount role in providing wood for the population. Although legislation technically permits the population to use natural forests on state land for their subsistence needs, there are conflicts with local authorities and public servants that demand bribes in return for permitting extractions. Therefore natural forests cannot be utilised by everyone that has access to them. The area of natural forests is still significant, but most HHs do not have access to natural forests because of the large scale deforestation around populated areas in the last century.

Protected areas are state property in Cameroon. Even though they constitute important areas of forest, they are per definition reserved for biodiversity, ecosystem services and tourism. This means their importance for the majority of the population in terms of wood provision is small. Joint forest management is practiced in some parts of protected areas in the NW in zones demarcated as community forest. This management approach includes the joint creation of management plans by the forestry post and a local community on a designated area, assigned to the community and acknowledged as their traditional territory.

Tree planting in protected or joint management forest is not common, however, there are efforts to expand the forest cover of the protected areas up to their partly deforested borders. The contribution of these reforestations compared to the total forest area in the NW would be, however, very small.

The state established large plantations of Eucalyptus sp. and native species in the 1950s. These areas were planted in response to the increasing fuel and timber demand on the one hand and the diminishing natural forest resources on the other hand. These plantations are called “Forest Reserves” and cover considerable areas. However, most have never been managed or exploited by the state (5, 6).

An emerging actor group in tree plantings are the local councils, the smallest public administration units of the Cameroonian government. Communal or “Council” forests represent a distinct ownership form as they are located on land that is owned by local councils. Council land is still state land in last consequence, but councils are completely independent from the government in their use of council land. Councils acquire their land either through purchase, donations or from land within the state domain within a formal procedure. The latter usually applies only to development projects such as the construction of schools and not for plantations. In order to receive donations, councils usually target the local chiefs who are the biggest landholders. Council forest is used exclusively by the council and the councils strictly enforce their ownership rights in case they want to use it. Lately councils have become active in the

establishment of tree plantations, reforesting relatively large areas in a short amount of time, considering their limited land and resources.

Unlike protected areas, Community forests and “Forest Reserves” surfaces, which are under direct supervision by the Ministry of Forests and Faun (MINFOF), non-gazetted- and private forests are largely outside government responsibility. It would be costly to assess their area, so currently there is no data on the extent of private forest plantations that could reflect their importance.

Non-gazetted natural forests, especially in the west and north of the region constitute an important portion of forest, unfortunately with no data on its extent. As these natural forests have been pushed back to these less populated areas (see Figure 4), most of the population does not have immediate access, so that the importance of these natural forests for the majority of the population is low.

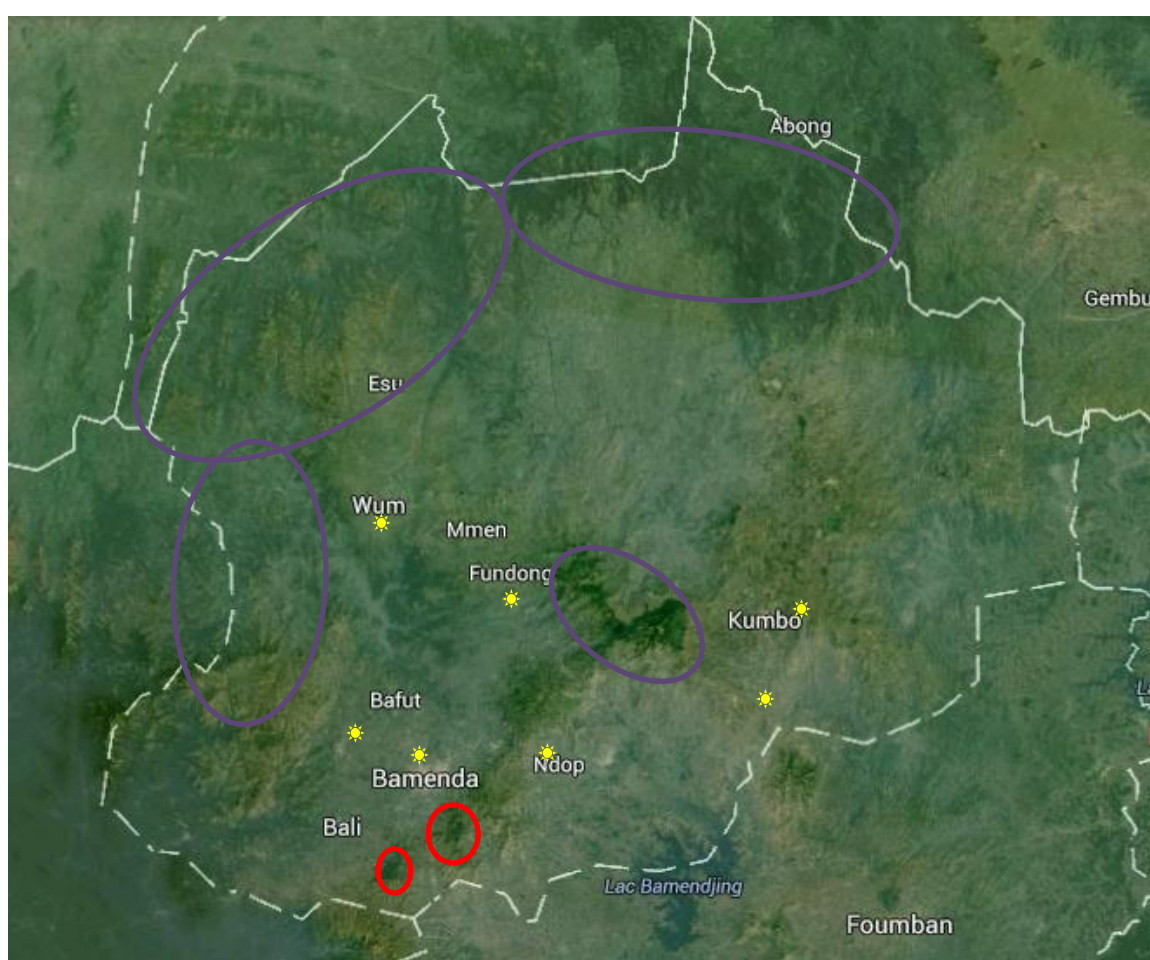


Figure 4: Natural forests (purple), selection of council plantations (yellow), Forest Reserve plantations (red). SH plantations occur throughout the region and are not marked here. Protected areas and community forest reserves mostly lie in the natural forest areas and are also not indicated in this figure. (Modified from Google Maps, 2013)

The largest part of forests in the NW region is made up of private SH plantations (16, 8, and 6). As formal ownership titles are very rare, SH plantations are equally on state owned land, but they may - in contrast to natural forest- be harvested by the planter or customary owner without government

permission (5). At the same time they are planted in and around villages and populated areas. These numerous forests therefore constitute the main source of forest products for the local population.

These SH plantations are usually very small in size (<1 ha) (16, 17, 9, 10, 8, 7, 18), often not reaching 0.5 ha, but extremely numerous, reflecting the small scale management and ownership patterns. There are indicators for a trend towards specialised forest owners, buying the forest of others SHs. Still, currently most HHs have trees and thus form part of the wood producing sector in the NW even though they may grow fruit trees or use their wood for autoconsumption. An exception to this general situation is found in areas where very fertile soil and good market access encourage a specialisation on agriculture.

Apparently most trees are produced by SHs and most SHs (91% of surveyed HHs) grow trees (1, 16, 17, 9, 11, 12, 8, 7, 18, 6).

The most important species is Eucalyptus sp. (in the following referred to as E), (1, 16, 17, 8, 18, 19) mostly E. saligna (6). Apart from E, SHs often have a species mix of fruit trees, mostly including Avocados, Mangos or Safou (see Table 4) in less aggregated structure, e.g. on fields or at home. Other plantations are established to protect watersheds including native species and those that are associated with water regulating qualities (“water friendly” species) (21, 8, 7, 18). (See also section 4.2.1.2 SH s’ motivation for forestry and tree planting)

#### **4.1.2 Wood resources and spatial structure of forests**

The producers of wood are identical with the main forest owners, namely the Ministry of Forests and Faun (MINFOF) in “Forest Reserves” and concessionaires in other natural forests, communities in protected areas, the communes, CSOs and SHs. As there was not sufficient information on the production of wood in protected areas and natural forests, except that these forests are being used by the population, I will neglect it here. Wood production from “Forest Reserves” will also be neglected here and only addressed later under administrative viewpoints, simply, because there has been no de facto management for a long time. Therefore, this section will focus on wood production by SHs, communes and CSOs.

In fact, there is no data about the development of forest area (7), but observations related to an overall decrease in forest areas were mostly made by respondents that were in contact with natural forests (5, 19, 22). Respondents that frequented areas that had been deforested for some time usually observed an increase in forest area (16, 8, 18, 6). This indicates a trend of tree planting in artificial landscapes on the one hand and deforestation of natural forests on the other hand. This equally applies to the number of people planting trees. More people plant in areas without natural forest (1, 16, 7, 6) and fewer people plant in areas with remnants of natural forest (21, 22). Despite these differences, the outlooks on wood availability are homogeneously negative. Apparently, there is an important decrease in wood volumes in the NW’s forests (2, 4, 14, 13, 17, 19, 22, 6). Additionally to this decline, the quality of the produced wood is decreasing (1, 16, 6, 24), foreshadowing a scarcity of wood, especially for commercial qualities

(16, 17). Currently most commercial wood is harvested in semi- remote areas that represent anthropogenic landscapes with a history of large scale deforestation and planting initiatives that lie in some distance to the regional capital (16, 10, 6).

### **Products and Prices**

Wood is mostly transformed into standard dimensions that vary somewhat between regions and with each chainsaw operator (see Table 2). The transformation of logs takes place inside the stands, because large stems cannot be transported as a whole without heavy machinery. Nonetheless, harvest of construction wood requires a large labour force at the point of harvest in order to move the transformed products, because the sawnwood is prone to theft if it is left in the forest. The chainsaw operator usually also market the wood, act as contractors for the Cameroon's electricity company AES Sonel providing stems for electric poles and therefore play multiple roles. Table 3 provides an exemplary cost/benefit calculation for the provision of electric poles to AES Sonel.

Table 2: Main products and prices of E. Source: Schlieper, 2013 (SSI)

Product	Dimension/ Description	Price (FCFA)	Price (€) <sup>1</sup>
<b>Eucalyptus Products</b>			
“2x12”	30x220x5000mm	2 000-2 400	3.00 – 3.70
“2x6”	30x120x5000mm	800-1 500	1.20 - 2.30
“Polines”	40x60x4000/5000mm	400-800	0.60 – 1.20
“Rafter”	40x130x4000-5000mm	700-2 000	1.10 – 3.00
“Electric poles” 9m	>15cm DBH	1 500- 3 000	2.30 – 4.60
“Electric poles” 11m	>20 cm DBH	2 000-4000	3.00 – 6.00
Tree for timber	>40cm DBH	7 000 – 15 000	10.70 – 22.90
Tree for timber	30 year old, tall	25 000 – 50 000	38.10 – 76.20
Tree for timber	50 year old, tall	60 000 – 70 000	91.50 – 106.70
Timber log (up to 4 per tree)	4m x 30-year-diameter	10 000 varying	15.20
Whole tree including fuelwood	>35cm DBH	11 000 – 20 000	16.80
Rejected “Electric pole”	15-25 cm DBH	1 000- 2 500	1.50 – 3.80
Small pole for scaffolding	10 cm DBH	500	0.80

Table 3: Exemplary cost/ revenue calculation of electric pole provision (17).

<sup>1</sup> Based on the fixed exchange rate of 655.957 FCFA per €

Cost item	Cost	
	Price per 11m pole (FCFA)	Price per 9m pole (FCFA)
Price to farmer <sup>2</sup>	3 000	2 000
Manual forwarding to road	300	300
Loading on pickup	200	200
Transport to Bafoussam	5 600- 6 900	4 500- 5 500
Council tax	71	50
Forestry service (certificate of origin)	28	20
Sale to middleman with license to sell to Sonel	750	750
Total costs	10 000- 11 200	7 800- 8 800
Sale price (E-quality)	15 000	11 500
Net revenue	2 700- 4 200	2 700- 3 700
Net revenue per truck-load	300 000- 400 000 (70 stems)	270 000- 370 000 (100 stems)

### ***Spatial structure around villages***

The spatial organisation of SH forests reflects how they are used by the people. Within the last 50 to 100 years, depending on the region, the largest part of natural forest around populated areas was cleared in the NW. Deforestation patterns followed human settlements and roads and expanded from there. This resulted in increasing distances between villages and forest resources over time. In order to transport the vital fuel wood to the village, more time and workforce became necessary and was finally missing elsewhere, especially for agriculture. In response to this, most tree plantations were established in relative proximity to settlements to reduce time and effort for transport. Notwithstanding this, a short way to the areas of agricultural production is even more important as crops demand more work input and frequent visits. Therefore as a general trend, tree plantations were created in proximity to villages, but further than labour demanding agricultural fields and on marginal lands. Private plantations therefore form aggregations around villages, schematically forming concentric circles of village centre, agricultural fields, tree plantations and pasture (Figure 5). More specifically, however, landscape development follows this

<sup>2</sup> The price to farmers is usually lower, depending on their bargaining power

scheme rather loosely, creating mosaic pattern. This pattern (see Figure 6) is a consequence of the distribution of land ownership among the inhabitants and suitability of soils for agriculture.

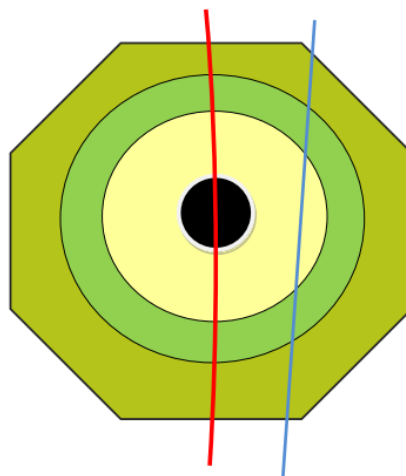


Figure 5: Scheme of land use in Cameroon's West region with village (black) in the centre surrounded by agriculture (crème) in turn surrounded by tree plantations (green) in a matrix of pasture and shrub land (yellow-green) (Temgoua, 2013)

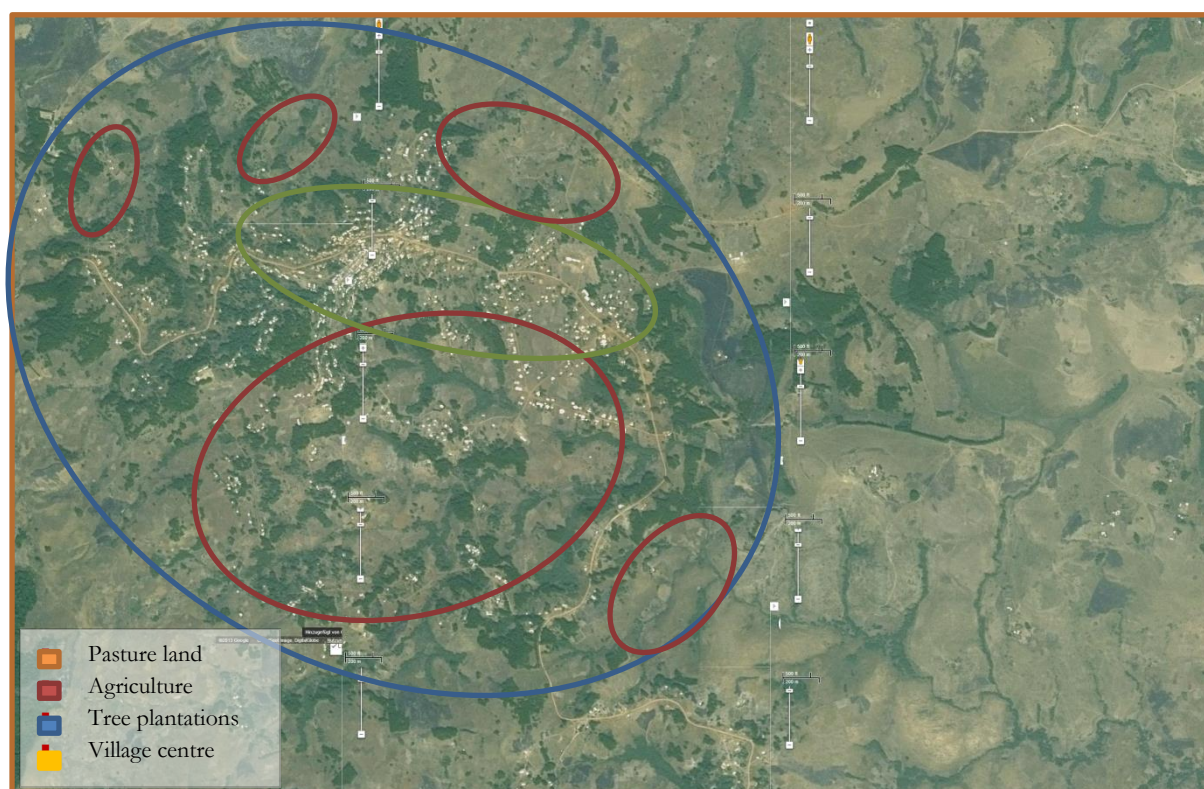


Figure 6: Land use in one of the study sites (Binka): The schema of concentric land uses around the village centre does not completely apply. Basic SH goals to have agricultural fields closer than trees and pasture and to plant trees on marginal land are complicated by individual land assets, resulting in a mosaic pattern. Apart from the relatively aggregated agriculture and tree plantations, pasture/ idle land occupies large areas. (Modified from Google Maps, 2013)



Among the different forest types, private SH plantations play the most important role for the forestry sector in the NW, because they apparently contribute the largest areas and especially the largest part of the current wood production. Considering their role in change, the small scale structure of SH plantations implies strong potential, because a marginal increase in the wood production and forest area of each SH could lead to a significant increase in these aspects on regional scale.

#### 4.1.3 Management

This section provides a short overview of the forest and tree management techniques applies by SHs in the NW. Traditionally, SH plantations seemed to included E in a mix with fruit trees and took the form of live fences around their properties in order to demarcate their boundaries or to protect the fields from animals (21, 16, 6). However, the high resource demand of E soon resulted in it being established in block form and monoculture. In its function to demarcate property, it is now often replaced by Cyprus sp.

Table 4: Observed and reported species in the NW including utilisation, location within landscape and seedling price. Source: Schlieper, 2013 (Observation, SSI and questionnaire surveys)

Species	Common name	Main use/ Product	Location	Seedling price (FCFA)
<b>Eucalyptus</b> <b>sp., mostly <i>E saligna</i></b>	Eucalyptus, Wood, Plank	Autoconsumption (A), Sale (S): Fuelwood, construction wood (see Table 2), delimitation of boundary/ occupation of land	Marginal land around village with important exceptions (see Figures 5&6)	50, (200 at ANAFOR)
<b>Raphia</b> <b><i>Raphia sp</i></b>	Raphia, Bamboo	A: Light construction, fuelwood, wine, land acquisition within commonly owned land	Valleys, anywhere	300
<b>Avocado</b> <b><i>Persea americana</i></b>	Pear	A, S: Fruit	Close to home, agricultural fields	350-500
<b>Mango</b> <b><i>Mangifera indica</i></b>	Mango	A,S: Fruit	Close to home, agricultural fields	250-500
<b>Safou</b> <b><i>Dacryodes edulis</i></b>	Plum	A,S: Fruit	Close to home, agricultural fields	250-500



<b>Cola</b> <i>Cola sp.</i>	Cola	S, A: Fruit	Close to home, ancestral land	?? <sup>3</sup>
<b>Cyprus</b> <i>Cupressus</i> <i>sp.</i>	Cyprus	Delimitation of boundary, Decoration	Around house, around fields	50
<b>Oilpalm</b> <i>Elaeis</i> <i>guineensis</i>	Palm	A,S: Fruit	Good agricultural field	500-750
<b>Coco palm</b> <i>Cocos</i> <i>nucifera</i>	Coco	A,S: Fruit		300
<b>Papaya</b> <i>Carica</i> <i>papaya</i>	Pawpaw	A,S: Fruit	Close to home, agricultural fields	200
<b>Bottlebrush</b> <i>Callistemon</i> <i>sp.</i>	Bottlebrush	Ornamental	Around house	150-200
<b>Lemon</b> <i>Citrus x</i> <i>limon</i>	Lemon	S,A: Fruit	Close to home, agricultural fields	350-500
<b>Guava</b> <i>Psidium sp.</i>		S,A: Fruit	Close to home, agricultural fields	?
<b>Prunus</b> <i>africana</i>	Pygeum	S: Bark to pharmaceutical industry	Tree plantations/ natural forests	?? <sup>4</sup>
<b>Maesopsis</b> <i>Maesopsis</i> <i>emini</i>	Maesopsis	A: Timber, Improvement of agricultural fields	Agricultural fields	?? <sup>4</sup>
<b>Teak</b> <i>Tectona</i> <i>grandis</i>	Tek	S: Timber	Agricultural fields/ tree plantations	?? <sup>4</sup>
<b>Malaina</b> ?	Malaina	A: Timber	Close to home, agricultural fields	?? <sup>4</sup>
<b>Mahogany</b>	Mahogany	S: Timber	Agricultural fields/	?? <sup>4</sup>

<sup>3</sup> Usually natural regeneration

<sup>4</sup> Only provided by ANAFOR, however, not always or in all ANAFOR nurseries. Prices seem to vary, but are likely to surpass 500 FCFA

<i>Swietenia macrophylla</i>			tree plantations	
<b>Khelendra</b> ?	Khelendra	Soil rehabilitation, cut-and-carry fodder for cattle in dry season	Marginal land, pasture, tree plantations	?? <sup>3</sup>
<b>Neem</b> <i>Azadirachta indica</i>	Neem	A: Malaria treatment	Close to home, agricultural fields, tree plantations	?? <sup>3</sup>

SHs usually plant E in aggregated structure and with small random planting distances of 0.5-1.5m (21, 16, 17, 12, 20, 22). Often these E plantations are established in areas with sufficient water availability in order to promote a fast growth of the trees (21, 4, 16).

More recently and mostly due to recommendations by CSOs and public services, SH establish plantations of other species, i.e. fruits, also in monoculture (21, 15,14), placing them according to suitable terrain rather than for easy access (1, 21, 15, 14, 13) as they do traditionally with fruit trees. These “new” plantation techniques include planting distances of 2x2 or 4x4 in a measured grid, especially when public services are involved in planning (1, 14, 12, 5, 18, 19, 22).

The nursing of fruit tree seedlings (the cultivation of seeds in a favourable environment to increase their survival rate after transplantation) is not very common among tree planters. Only few SHs engage in this activity. Often, planters just place the desired seed in the soil and compensate low survival rates with high seed numbers (available from high consumption of fruits (mango, safou, avocado)). Also, seedlings of the most popular species are locally available at moderate costs or for free, especially E.

SHs will typically nurse their own seedlings, if they want to plant more trees than there are available at the market, or than they can afford to buy. This need to create a nursery applies more to E than to fruit trees, because E is planted at larger quantities at a time and thus requires more seedlings at once. Consequently, people know more about the nursing of E than about any other species.

Seeds for E are obtained from mature trees, usually when these are harvested and apparently without preference for form of the parent tree. These seeds are either sowed directly in small ridges on the fields, or nursed in seedbeds at the beginning of the wet season. The preparation of a seedbed includes burning grass, either superficially or after covering it with soil (“Ankara”). After germination seedlings are usually replanted directly or transferred into polyethylene bags to increase in size before planting. The use of planting bags from local material as reported from the west region (Temgoua, Njoukam, & Peltier, 2011) was neither mentioned nor observed.

Often seedlings are left in the seedbeds for one year and then transplanted directly to the plantations site. The technique includes uprooting the seedlings from the seedbeds immediately before planting and transferring them to the plantation site with bare roots instead of transplanting the seedling into a polyethylene bag with soil. This practice sets a time limit of 2 days for the planting of the seedlings after uprooting after which the seedlings will have dried up and died (17).

Planting practices can also be distinguished by the type of fertiliser used, which ranges from dung and inorganic fertiliser to decayed leaves. Remarkable is the common practice to wait several weeks before planting after fertiliser has been applied. Preparation of the soil before planting involves tilling, burning, weeding, or no preparation at all.

Planting practices on site vary only between fertiliser use, site preparation, and the use of polyethylene bags or transplants. Planting itself involves digging holes of 30-40cm depth, placing the seedling inside and filling up the hole.

Weeding around the small plants is the most important activity in the care for a young tree plantation. It is connected to a considerable work effort, but at the same time indispensable to reduce competition of grass for light and nutrients with the small trees. Additionally a thoroughly weeded plantation is much less prone to destruction by fire, but sometimes small trees are overlooked and themselves fall victim to weeding. The application of fertilisers to spur growth of seedlings after planting is far less common.

Trees compete with other vegetation but also with each other for light water and nutrients. This means the more similar plants with similar demands grow in a given area (in the case of tree plantations at a smaller planting distance), the higher the competition is between them (16, 17). Trees often respond to competition for light with increased height growth, which has been characterised as beneficial for stem quality in the case of E plantations (16, 17, 20, 22, 6). However, competition also reduces overall growth, if it becomes too strong, so that periodically competition is reduced by cutting some of the trees in the plantation (thinning). This contributes to stem quality by removing trees with unfavourable characteristics and favouring remaining trees, thus ensuring their diameter growth (16, 17, 20, 22, 6).

The more trees are planted, the more trees need to be thinned until the final harvest. The frequency in which thinnings take place is not fixed, so that a plantation of many trees allows for more thinnings in possibly irregular intervals, creating more work, but also more flexibility regarding the sale of products from the plantation (see objectives and strategies of SH) (17,18, 6). Additionally a high initial density will provide a buffer for casualties (17). A third function of small planting distances is the shorter maintenance period in which competition for the trees by other vegetation needs to be reduced. This vegetation is suppressed by the trees once they form a canopy, which happens the sooner, the closer the trees stand (17, 5). On the downside, small planting distances complicate the weeding between plants.

Plantations are only seldomly protected, due to the high costs connected to it. The most common protection is the individual protection of plants with small sticks placed around the young seedling.

In terms of harvesting, SHs only cut lower branches for fuel wood, using machetes and leaving branch stumps of often  $>10$  cm, which may be to the detriment of stem quality (6). The harvest and processing of trees is almost exclusively done by specialised chainsaw operators. They either charge forest owners for the processing of the tree or buy the tree, process, transport and sell it. Usually, all non-commercial wood that remains after processing can be used by the plantation owner.

In contrast to most SHs, councils rely on the technical support of the public services for the management of their plantations and closely follow their suggested techniques. This means they usually plant “water friendly” species in wet areas and E otherwise. They use seedlings provided by the public services that are nursed in polyethylene pots and that received good soils and care. Planting distances are a 2x2 or a 4x4 grid. Councils fence their plantations only in some cases and rely on the choice of their plantation sites mainly on the availability of land via donations or purchase, which is mostly located at moderate distance from the centre.

## 4.2 ACTORS AND OBJECTIVES

### 4.2.1 Smallholder livelihoods and tree planting

#### 4.2.1.1 Vulnerability context

The motivation of SHs to engage in wood production and tree planting depends on the benefits they expect to gain from these activities and the disadvantages an engagement could bring. Applying the concept of economisation, HHs will utilise their scarce resources (assets) to yield the greatest possible benefit – again in the form of an increase of their assets. (The component of LH outcomes is neglected in this study (see problematic).)

The HH's access to assets may be directly or indirectly restricted by external factors, like population growth, subsidies, climate, seasonality or commodity price fluctuations. The whole of these factors form the vulnerability context, the context that describes the conditions under which people gain access to assets.

#### ***Resource availability***

The relative land scarcity that has already emerged throughout the NW is likely to aggravate in the years to come. An overall population growth has been evident and with it an increasing demand for food, fuel and construction material (1, 21, 5). Food prices have also increased due to increasing exports to neighbouring countries and are likely to continue to climb with the transnational infrastructure development (1). In response, agricultural intensification and expansion have also increased (1, 5, 20). In addition, farmland is being reduced as soils lose their fertility or are being occupied by the expansion of villages and towns (21). Simultaneously, migration to cities for employment opportunities decreases the

rural workforce, but increases resource demand from the growing urban centres and therefore food prices (21). The land that is left idle due to labour shortage is hardly ever rented or sold to its users, mostly, because owners fear a permanent occupation, or because tenants do not know about the availability of this land. Large landowners usually do not sell their land and try to prevent occupation. The village councils (of which large landowners are usually part) is also zoning land. They restrict the conversion of certain areas, usually used as pastures that often present the idle land of large landowners.

Parallel to the rural exodus, there is also an urban exodus of people returning to their villages, which reflects that the alternative income in urban centres is limited and in fact does not represent a viable alternative to agriculture and forestry for many that migrate in search for employment (17).

Another trend of fundamental importance that has not had a strong direct impact, but worries the population is a decrease in water availability in the NW (see Environment below).

### ***Land Use Competition***

The landscape of the NW region is intensively shaped by its inhabitants. Most natural forest has been replaced either by agricultural fields, tree plantations or pasture. These land uses are viewed as competing, especially in the case of E plantations (2, 21, 3, 15, 13, 17, 12, 7, 18, 6). Also neighbouring land uses may compete as they can have strong impacts, e.g. E reduces crop yields up to 20m from its position, potentially on the neighbours' fields. Therefore the plantation of E in proximity to agricultural land creates conflicts (21, 11, 5, 18). Equally, there are frequent problems with the penetration of livestock into fields and plantations, destroying crops. This competition is a hindrance to high investments, as it creates a higher risk (11, 5, 7, 18, 19), e.g. of cattle destroying tree plantations. Especially in remote areas the competition between cattle herders and agriculture is growing more acute as agricultural expansion is clashing with the high land demand of cattle herding (18).

Those people that return to their villages from urban centres often have aspirations to purchase land and to start a profitable land use there. The need for financial assets - obtained with wage labour - to make rural farming worthwhile, may reflect a land ownership structure that prohibits a profitable engagement in agriculture or forestry for SH with little land. It also implies a lack of knowledge about more intensive farming systems that optimise productivity or profitability of the available land (17).

The competition between land owners can even lead to envy and intentional destruction of tree plantings (11, 5, 7, 19). Tree plantations may be a preferred target, as they are a symbol of wealth, requiring land availability (beyond auto sufficiency) as well as investment capital for the plantation's establishment (21, 14, 13, 16, 17, 8, 6). In general, land ownership distribution is very unequal with large landowners having huge land reserves (21, 17, 18, 19). As most of the land is held under traditional title, the first settlers and chiefs claimed the largest areas. The right to use these lands or to even become an owner can be granted, depending on the relationship with the landowner and possible service in return. These large land owners

often donated land for planting purposes of associations or councils, but not for individuals (2, 15, 14, 18). For SHs, especially the permanence of tenure is an important requirement for tree planting. SHs are completely reluctant to plant trees on land that has been rented or “begged” (2, 13, 10), as owners are known to demand it back without further notice. Public development projects are equally feared by SHs, as their usually not formally titled land may be requested by the authorities without compensation. In this regard, political power is an important factor, as defending the land against a public demand involves negotiation with officials (1). As signing a contract for a plantation project with ANAFOR, a public agency that is promoting tree planting under the administration of the MINFOF, includes the recording of the utilised land, which is seen by SHs as providing some degree of formality, it is one motivation to sign up, even though the recording does not result in a formal title (1).

The allocation of land use rights is not uniform. Officially, a land use plan is created by the MINFOF and Ministry of Agriculture and Rural Development (MINADER) with certain CSOs (6). In villages an informal land use plan is determined by the village council. Pasture serves as land reserve and grazing grounds and may only be converted to agriculture or forest upon permission by the village council, even if the land is owned privately. These and other customary institutions of land use control often overlap and form heterogeneous conditions for tenure. These overlapping and conflicting arrangements reduce tenure security and discourage tree planting by complicating land use planning and making the process more expensive.

### **Market**

The availability of a stable market is a decisive motivation for tree planting (1, 2, 21, 4, 16, 6). Although wood prices have been stable, farmers that are rushed to sell may not achieve the market price or may not be able to sell at all, because sales are mostly initiated by the buyer. Tree producers are basically at the mercy of sellers because there is neither a central market to sell to nor a way to invite offers from other buyers. The few wood producers' associations are very weak (6). The SH's willingness to sell wood is mostly triggered by urgent cash need, which explains the low prices farmers accept. Buyers associations of the middlemen in contrast are very powerful, which is also due to their low number and the low number of middlemen in general. They fix the downstream price to their buyers, like AES Sonel, Cameroon's electricity and grid provider that buys E stems to produce electric poles, or to other timber merchants. They also fix the upstream price for farmers as the lowest possible price at which the farmers are believed to still perceive wood production as a worthwhile activity (16). Despite the organisation of middlemen, Sonel has an equally good market position, being the monopsony for electric pole stems. They give out supply licenses in order to create competition among middlemen. This allows them to keep prices for electric poles at bay (17). However, it is to be doubted that an increase in the electric pole or timber price for middlemen would be passed on to wood producers (16, 17, 7, 6). Therefore, the current market structure is quite unfavourable for wood producers (7) and they may not profit from the increasing wood prices, except indirectly from auto consumption.

## **Environment**

The increasing demands on land do not only create competition among crops or trees, but also with ecosystem services. Along with the reduction of natural forest, there has been a loss in biodiversity (5, 7). Equally, a steady reduction of the water table has been observed and attributed to the cut of trees next to streams and the plantation of E (3, 8, 7, 19, 6). Many steep non-forested hills in the NW present a landslide risk (1, 8). Even from a purely anthropocentric perspective all these factors will require attention and space in the near future, adding to land conflicts.

Irregular and atypical rainfall patterns have been attributed to climate change (21) and result in insecurity regarding crop yields and water availability. The variability of seasons and rainfall in seasons, have increased awareness about dependence on climate and thus indirectly on environmental services.

### ***Asset constraints from the vulnerability context***

Under the current unequal ownership distribution, overlapping institutions that control land use and difficult rent and sale situation, the access to land for agriculture and forestry is the main asset constraint for rural HHs. The various regimes that control land use, from national governance over village councils to sceptic private owners play a key role in this context. The population growth and increasing demand for agricultural and forestry products aggravates the demand for land and especially reduces the willingness of land owners to sell or share their land. Another assets constraint results from the rural context of most villages in the NW. The lack of opportunities to generate income that is not directly related to agricultural and wood production, increases land demand on the one hand and limits HHs' possibilities to generate financial income on the other hand. This in turn prevents the development of agricultural production in intensity and diversity. The generation of financial income from primary products is impeded by the weak market position rural producers have vis-à-vis intermediaries. The main constraints in the order of importance are therefore access to land, access to financial income and market position.

#### **4.2.1.2 SH s' motivation for forestry and tree planting**

In the rural setting of NW villages, where manufacture and service sectors are largely undeveloped, land is a key asset, as the production of food and wood for themselves (autoconsumption) reduces the need for cash income or enables HHs to invest it elsewhere. This is why the decision on land use is of central importance for SHs' LH strategies. Products from fields can not only be consumed by the HH but sold, which adds another dimension to land use planning, e.g. cash crop vs. food crop. In fact, there are numerous other factors that influence the decision of land use, like soil quality, terrain, distance to home or to the nearest road, form of ownership or tenure of the respective field. In addition to these modalities, alternative income sources and the available workforce play a decisive role in the decision on what to invest and what to produce. Naturally each HH chooses the use of its assets in order to maximise their livelihood outcome.

Regarding land use, this means that each family is allocating its land optimally for a maximal outcome considering their available means (17, 11, 11, 7, 19, 22, 6).

The specific strategies SHs pursue by planting specific crops on specific land with specific inputs etc. can only be appreciated if they are put in context with their concrete objectives, which form the basis of their decision. Therefore, understanding these objectives is also fundamental in explaining SH action regarding trees, i.e. why they do or do not plant trees.

The socio-economic context of SHs in the NW is dominated by the rural character of their villages and the corresponding factors mentioned in the vulnerability context. Irrespective of their circumstances, SHs generally work to secure their present and future livelihoods and build assets like education or financial reserves in order to increase their well-being and to become more resistant to possible shocks.

The most important goals SHs pursue are outlined below. Nutritional safety is paramount for SHs. In rural settings, wage labour opportunities are scarce, so that most people do not have enough money to purchase food year round. Therefore the first objective of most HHs is to attain food auto sufficiency (1, 2, 21, 16, 17, 11, 20, 22), by producing staple crops like corn, beans, potatoes and coco yams.

A second basic need is fuelwood for cooking, because the prices of fossil fuels are prohibitive. Considering the large amounts of wood needed annually most HHs try to rely as little as possible on the market for this fuelwood and instead try to attain it from their fields to save money. This applies even more so for construction wood with its considerably higher price (21, 4, 17, 11, 19, 20, 22).

Wood production presents a trade-off with crop production, especially in the case of the resource demanding E, which is why the expansion of agricultural production in terms of area and inputs can be observed (2, 21). Among the two, food production is first choice, but even HH that do not reach food auto sufficiency year round, have trees, implying that tree provide services to SHs that in fact have a higher importance than complete autarchy in staple crops.

In contrast to trees that existed as natural vegetation, planted trees reflect the use value they have for their planters. Although there is the possibility that respondents did not mention natural species exactly, because they do not use them, this is very unlikely for the intensively used soils around the study sites, where little vegetation is allowed for long that does not have a direct use. However, one species which was obviously underreported, because it was simply forgotten due to its integral part in the culture and multipurpose use, is the *Raphia* palm (*Raphia* sp.). Despite its uses for the population, fruit trees play a larger role for livelihoods than *Raphia*, as even one fruit tree can contribute considerably to the nutritional and financial safety of a HH. SHs' choice of non E tree species mainly mirrors their pursuit of nutritional safety. The importance of fruits for health in adding vitamins to a diet which is dominated by starchy staple crops has often been emphasised in this regard. Fruit trees are a diversification of SH food production and their yields are more resistant to climatic variability, like drought.



E also plays a fundamental role in HHs' daily lives for autoconsumption. Most E was planted to provide fuel wood and E forests now form the dominant part of tree plantations. But apart from autoconsumption, the production of wood generally has, compared to fruits, distinct characteristics that make it attractive to SHs. In contrast to fruits, wood products are not as perishable, which allows stocking them for some time. Also, wood producers are flexible on when they wish to harvest in contrast to fruit trees that produce seasonally. These characteristics of wood production add to SHs' flexibility. Reducing risk and increasing their capacity to cope with shocks is a central and fundamental strategy of SHs.

Compared to agriculture, trees have a longer rotation age, i.e. they occupy land for a much longer time until they can be harvested and thus reduce the flexibility of SHs' product portfolio. In order to minimise this constraint the farmers choose of E with its unmatched fast growth. To add more flexibility to forestry activities, trees are planted at small distances, which allows to harvest at different ages for different products. This practice is remarkable as farmers pay a high price for this flexibility in higher seedling cost per m<sup>2</sup> and more work for thinning (17, 11, 10, 7, 20, 22, 6). Another characteristic of SH tree planting are the relatively small areas planted in the course of one plantation project (19, 7). On the one hand this allows for more seedlings per m<sup>2</sup> at a given budget, on the other hand it allows the farmer to be sure of the plantation's success before expanding it and possibly saving valuable land, time and money in case the plantation fails.

People are sometimes reluctant to plant E, concerned that it may reduce soil fertility or water availability (11, 5), or replant areas to restore fertility and increase the water table. Then again some plant trees irrespective of their possible impact on the environment in order to maximise growth rates of their crops and especially E trees (18).

Anticipating an increase in land demand, the sale of land is only considered in extreme need of money, as land prices are at an all-time high and rising (13, 11, 5, 8). Although land sales could provide considerable funds, e.g. for the development of agriculture, access to land is considered as the best insurance against food shortage, even if the land is infertile. Reducing land assets means reducing flexibility in the choice between cash income and autosufficiency.

Related to farmers' desires to stay flexible and to prepare for possible shocks is the concept of risk aversion. An investment is only attractive if outcome and factors that influence its success are predictable and stable. This is especially problematic in the case of trees with long rotation age and high investment costs, because the long time horizon permits dramatic changes e.g. of the HH's needs or product prices until the harvest. Farmers will only invest into a tree plantation if they are sure about its profitability. For many SHs the expected demand is a decisive factor investment (1, 21, 3, 4, 16, 9, 8, 18, 19). Even at a high demand farmers may be reluctant to plant if they cannot predict within what time frame they can sell, if they decide to harvest. And even if farmers feel sure about this and want to plant, they may find it hard

to bridge the income gap between forgone revenue from crops and future revenue from trees (1, 4, 13, 11, 5, 8, 7, 19, 22, 6). Another downside of the long rotation age is the equally slow increment in the planters' knowledge about the trees growth characteristics. The familiarity with E as planted crop gives it an advantage over other exotic and even native species (11, 5, 18).

In the dry season, there is almost no agricultural production. In this period, the sale of wood is an important income source for some plantation owners (17, 11). Unfavourable circumstances for harvesting wood in this time of year are the little resprouting success of harvested stems (17), which may result in the need to replant the harvested areas and a reduced demand compared to the wet season.

Compared to agriculture, tree plantations demand high initial investments for the seedlings, fencing and weeding. If farmers are not sure they will be able to provide enough money (1, 21, 13, 9, 11, 8, 7) or workforce (1, 21, 13, 16, 9) they will not start in order to not waste time or money. Notwithstanding that, once investments are made, planters are highly motivated to maintain their plantations (3, 11, 18).

SHs often see wood plantations as a long term strategy that can provide financial income in the long run (17, 18), especially in the face of anticipated demand increases. Plantations also represent an asset reserve resembling a savings account. It can be utilised in case of need and increases in value until this point.

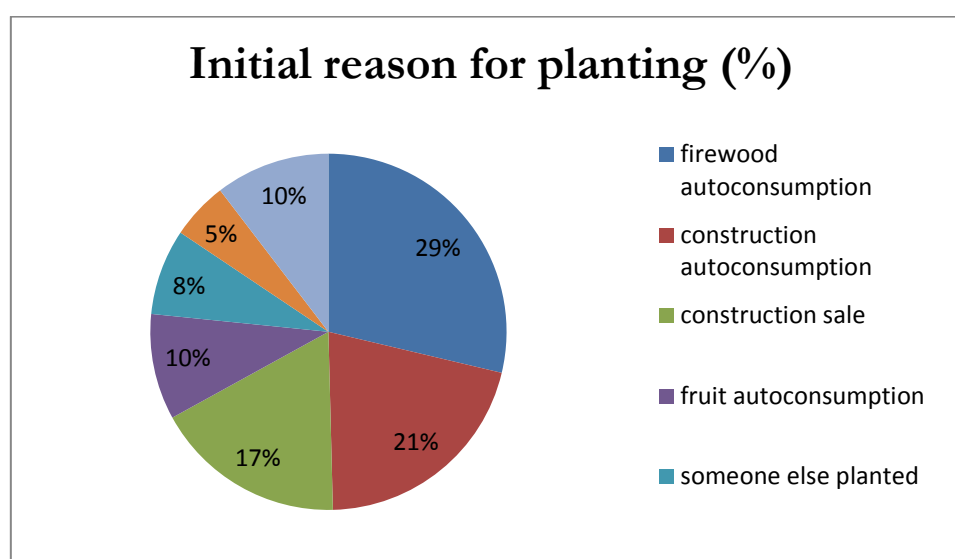


Figure 7: Initial reasons for planting. Percentage of all respondents with trees (multiple responses possible, but rare). Source: Schlieper, 2013 (Questionnaire surveys, see Annex 4)

In contrast to the initial reasons to plant (see Figure 7), the main motivations for tree planting now is the generation or diversification of financial income, (1, 17, 9, 11, 10, 8, 7, 18, 19, 6), autoconsumption (17) and the aspiration to secure land, without investing workforce or money for this task. (4, 11, 7, 18, 19). This ratio is varying with the land, the financial assets and the workforce a HH has access to. There are also distinct

motivations between planters of different age groups. While young planters have the provision of fuel and construction wood for their growing families in mind, older planters see plantations as an investment for their retirement, allowing them to create financial income without investing physical work (11). Questionnaire data allow to cautiously support these relationships, however not on the basis of significant differences between groups (at a 68% level of confidence).

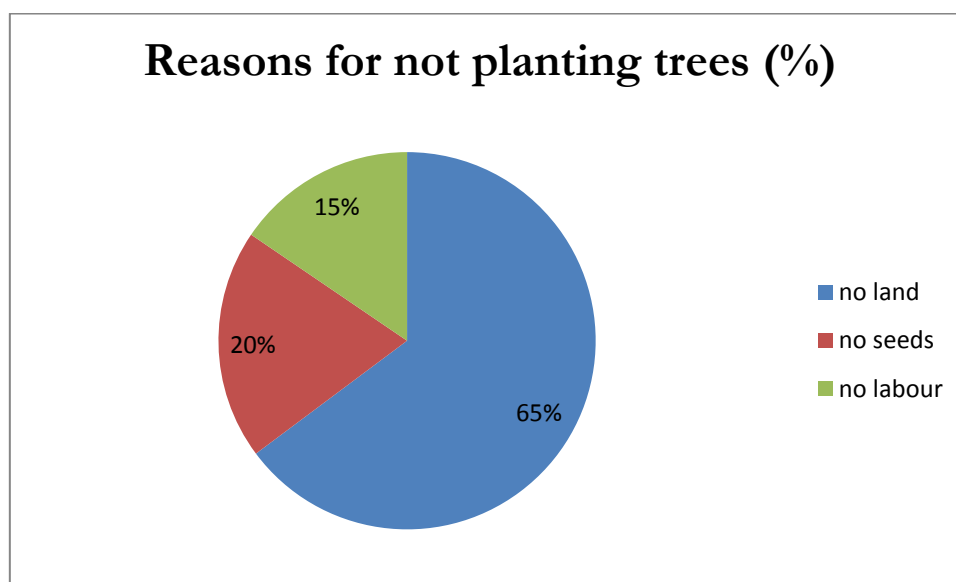


Figure 8: Reasons for not planting more trees. Percentage of all respondents that stated they do not plan to plant (more) trees (81%). All categories “No land”, “No seeds” and “No labour” each include responses related to the lack of funds to purchase these respective resources. Source: Schlieper, 2013 (Questionnaire surveys, see Annex 4)

SHs’ species choice of fruit trees and E for wood provision is evident in all 3 sampled villages. Variation between villages may be the result of their different qualities of market access, which in turn results from their different distances to the regional capital Bamenda. The high share of Mangos in the species grown in Bamessing, the village closest to Bamenda, indicates that this tree is more profitable, possibly due to lower transport costs and –damage and access to a better market. Marketing, transport costs and perishability of products would also explain the relatively higher importance of E and lower importance of fruit trees with increasing distance to Bamenda (see Figure 9). This relationship may be blurred by two aspects. On the one hand are SHs in Bamessing, disproportionately more involved with agriculture, because of warmer climate and fertile soils and therefore have fewer trees in general. On the other hand, respondents have tended to mention only the species with special importance to them and have often forgotten fruit trees, which is why fruit trees seem to be underrepresented in the questionnaire survey, but this should impact the comparison between villages only in case people mentioned their fruit trees more or less often in different villages.

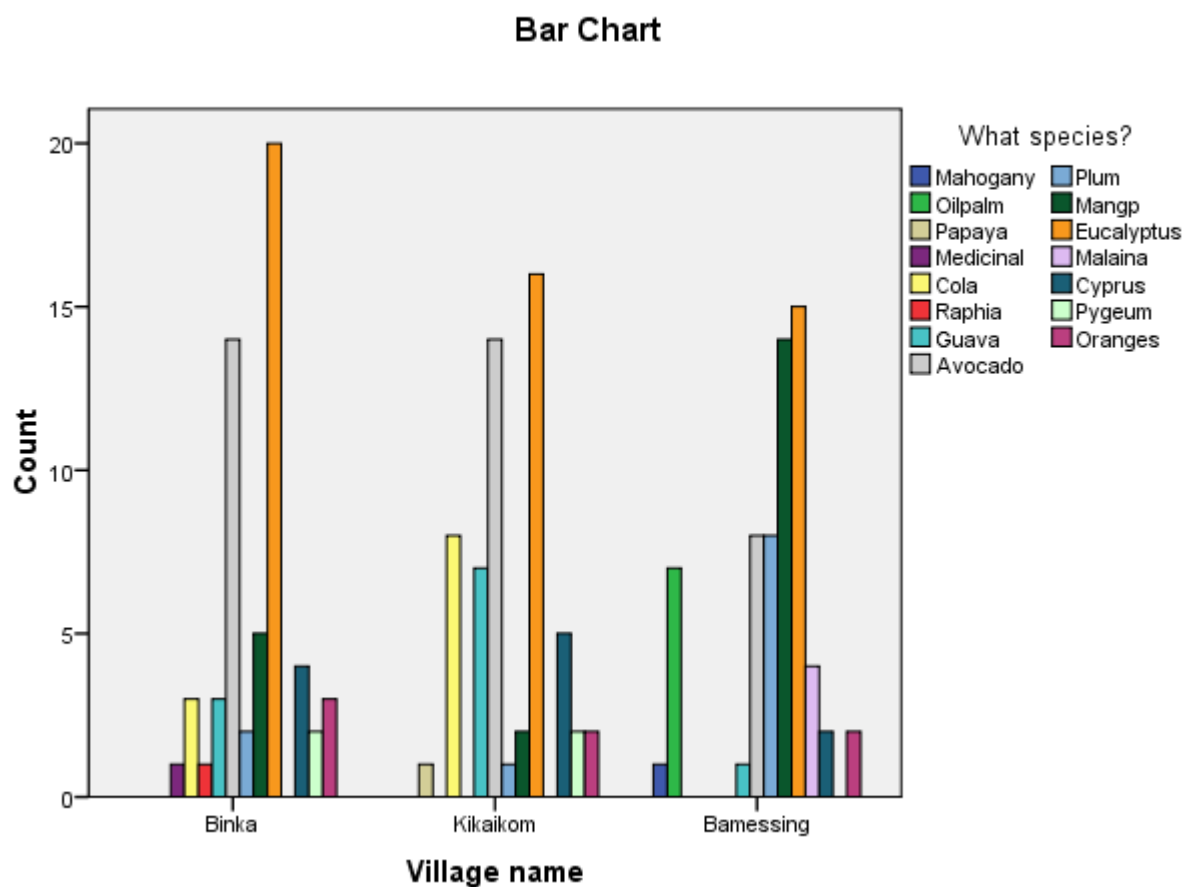


Figure 9 : Species planted by respondents in all 3 villages (multiple responses possible). Source: Schlieper, 2013 (Questionnaire survey, see Annex 4)

Environmental protection and restoration also seem to be an important factor in the decision for a tree plantation (3, 17, 11, 7, 18, 19, 20). The contact with other actor groups is not very widespread. Although farmers take advantage of government services like ANAFOR for seedlings (2, 18) and also in order to reinforce the ownership status of their land (9, 19), many SHs avoid contact to governmental institutions fearing bureaucracy, fees, and taxes (1, 13, 11, 8, 18, 19).

## 4.2.2 Objectives and Strategies of other planting actors

### 4.2.2.1 Council Strategy

An emerging actor group in tree plantings are local councils. Councils are the communal administrative agencies and are traditionally charged with the administration on sub-divisional level and the execution of local infrastructure projects on designated land (council land). This council land may not be used directly after allocation to the council, so that it is often used by farmers in the meantime, which is tolerated by the councils (1).

Lately many councils have started to plant trees, trying to permanently increase forest cover on council land (15). Some of these efforts are motivated by a corresponding request by the government (15, 7), while others are local initiatives (14). Councils may pursue economic profit (15), satisfaction of local demand, a combination of the two (13) or support of other public institutions in kind such as the provision of wood for the construction of schools (14). Profitability seems to be the most important or most widespread motivation (8, 7, 6). Plantations are profitable for councils, because the Ministry of Forest and Faun (MINFOF) is providing large and lucrative funding for the council afforestation and indicates to continue this policy (15, 13, 11, 8, 7, 6). Councils can expect profits from the harvest of the planted trees and do not face the high establishment costs. They can rely on their regular workers for labour and for ANAFOR and MINFOF posts for technical assistance and seedlings, which further contributes to the profitability of council plantations (15, 14, 13, 11). *E* and *Prunus africana* are the first choice for future return, whereas other native species are often planted if their seedlings are available cheaply or for free (15, 14, 13). As the creation of plantations can improve their financial situation, councils are eager to take an active rather than passive role in afforestation which they could do for example by allocating land for farmers to plant trees (11). Often, the land used for these council plantations has been donated by large landholders and chiefs upon request (15, 14) or with prospect of benefit sharing with the communities, but at the same time neither the amount nor the sharing system has been agreed upon yet (15). In one case where council land had been (illegally) occupied by farmers, a tree plantation on this land was established with a Taungya system, which allows the former squatters (and others) to farm between the small trees until the canopy closes. This method does not only reduced the council's labour for weeding around the trees, but also gives farmers time to anticipate the loss of productive area (13). Fertiliser subsidies to the farmers also largely benefited the (E) trees (that attained a size of 2 m in about 18 months after planting). Council plantations are also to be an example for private planters in terms of technique and are to prevent wood scarcity until private plantations can satisfy the prospected increase in demand (13), but as of now in their current form and extent of only about 100 ha at present, council plantations do not seem to have any significant impact on SHs.

#### 4.2.2.2 CSO Strategies

CSOs involved in tree planting follow two main strategies to promote tree plantations. One is creating independent plantation projects (1, 2, 21) and the other is motivating individuals and other CSOs to plant (2, 21, 3). For the first option, CSOs acquire land for their planting efforts (1, 2, 21) which is mostly donated, either from the CSO members or from large landholders that support watershed protection projects in particular. This strategy is more characteristic of smaller and local CSOs.

The second option, motivating people to plant, requires an understanding of the situation of SHs. It seems most CSOs have understood that a farmer's motivation to plant is directly linked to his potential benefit and that tree planting needs to be in line with his goals. However, there are vast differences in the interpretation of farmers' goals especially regarding the weighing between economic and environmental benefits.

The first step in convincing farmers or associations to plant is to raise awareness about the economic (2, 21) and the environmental (1, 2, 21, 4) aspects of trees. CSOs often introduce innovative tree propagation and planting techniques (1, 21, 3, 11) and act as capacity builders for farmers (1, 2, 21, 3, 4, 8). This "knowledgeable" role brings them in the position to recommend species and where to plant them. This is where the individual objectives of the CSOs may influence and even conflict with farmers' objectives. In practice this means that some CSOs recommend a larger share of "environmentally friendly" species than farmers actually desire (2, 11), or to occupy important agricultural areas with trees. In order to minimise financial constraints for potential planters, CSOs offer seedlings, the main cost factor (depending on plantations size), at the lowest possible prices that still cover their production costs (1, 21, 3).

Apart from facilitating direct planting efforts, CSOs also try to increase their own capacity by attending seminars that are often organised by larger CSOs (1, 2, 4). These seminars are an important tool for knowledge exchange and alliance building between smaller CSOs, permitting them to use their resources more effectively and giving them more power in lobbying (1, 2, 21, 4). The Network of Environmental Stakeholders (NestCam) for example, is an association of CSOs that is trying to facilitate information exchange between its members and, more specifically, to lobby with governmental agencies (1).

#### 4.2.3 Objectives and Strategies of Non-planting actors

##### 4.2.3.1 ANAFOR Strategy

After the reorganisation of the MINFOF, ANAFOR was created as the entity charged with reforestation. In contrast to its predecessor, the National Organisation for Reforestation (ONAREF), ANAFOR assumes a passive role in tree planting via the sale and distribution of seedlings and capacity building of its customers. Its primary objective is the development of the wood producing sector in order to secure the supply of wood products (7). This objective is largely translated into an increase in forest area via planting (13, 11). For this purpose ANAFOR is working with councils, CSOs and private persons and establishes contracts for each planting (11, 7). Hereby their focus is on the establishment of plantations >1 ha (5, 7, 6). ANAFOR

employs subsidiary “extension workers” in each division to present ANAFOR to the population and to promote and to execute tree plantings.

In search for potential planters, extension workers frequent village reunions and contact associations directly, as these are easier to find than interested SHs (13, 11). Therefore farmers are underrepresented in ANAFOR's customer portfolio (13, 9, 7). ANAFOR's capacity building events on silviculture equally target mostly groups (11, 12, 8, 7).

ANAFOR's service for councils represents a special case, not only because it involves very intensive planning and supervision, or the supply of seedlings, but because it can include monetary funding for the creation of plantations (13). For farmers, ANAFOR employs only indirect subsidies, e.g. in form of the transport of the seedlings to the field or tools (11, 7).

Like CSOs, ANAFOR extension workers advise farmers on which tree to plant on which kind of land, e.g. agroforestry species on farmland, shrubs, fodder or E on grassland and “water friendly” species close to water courses. (11). However, this recommendation may also be based on the seedling availability in the ANAFOR nurseries (12). And as with CSOs, the recommendations tend to be, despite devotion to farmer centred approaches, biased to favour native and “water friendly” species (8, 6) or tend towards economic development via E (7). ANAFOR is trying to ensure an intensive preparation of contracted planters, including the farmer centred approach and intensive follow ups to guarantee the success of the plantation (11, 7). Still, this service cannot always be provided due to time constraints of the extension workers and possibly, because farmers do not insist on relying on them for advice (12, 18, 19). On the other hand, ANAFOR is not strict in enforcing the contracts, if farmers' situations changed and they cannot plant as much as agreed (11). Like CSOs, ANAFOR is also subsidising seedlings (11, 5, 8, 7, 6) and sometimes giving them away for free (11, 5, 8, 6). They emphasise the importance of high quality seedling material, especially for E. This results in seedling prices of up to twice the common price in their nurseries (7).

The >1ha strategy ANAFOR employs is basically a strategy to optimise their given resources. First, it aims to ensure that each plantation receives adequate follow up, considering the limited number of extension workers (1 per division) (7). Secondly, large plantations will lead to fast increases in forest area, as compared to many SHs at a given number of extension workers. Thirdly, ANAFOR is responsible to account for the areas planted and the accounting for small surfaces cause more expenses per ha than for large ones. The last point is important in the face of ANAFOR's accountability towards the central ANAFOR agency and the MINFOF. ANAFOR is obliged to present exact numbers to account for their success regarding the stated objectives on planted area (7). Their objectives are ambitious, especially considering their joint objectives of designing each plantation according to the planters needs. The prospect of facilitating a large scale planting in case of the council, adding several hectares to their balance sheet at once even brought ANAFOR to fund this plantation entirely. ANAFOR's >1 ha strategy is certainly comprehensible, but does not take into account the realities of most SHs in the NW with the intention to plant only small areas at once and with

their multiple demands to a plantation. Therefore, ANAFOR's approach to the private sector is somewhat questionable.

In response to the low attractiveness of ANAFOR for farmers that do not want to plant >1ha at once ANAFOR has created a brochure with an exemplary cost calculation for a 1 ha tree plantation.

ANAFOR's impact on SHs is relatively low, as the small number of extension workers does not permit ANAFOR to contact the majority of potentially interested planters. SHs often do not know about ANAFOR. Additionally, ANAFOR projects may compromise SHs' goals as the assessment of SHs objectives is hardly possible, given the extension workers' time constraints. The SHs' lack of knowledge on options requires intensive counselling. Also, ANAFOR's pressure to effectuate plantations may give priority to suggestions that involve species that are available in the local ANAFOR nursery.

#### **4.2.3.2 MINFOF Strategy**

The MINFOF's objectives regarding forests in the NW are very multifaceted, already by the nature of their responsibility. They practically consist of the expansion of forest area on all land use types (protected areas, "Forest Reserves", private- and council land) (5). At the same time its objectives comprise the expansion of environmental services like watershed protection and climate regulation, which are also linked to an increase in tree planting (5, 6).

In their responsibility for all the forest on state land, the MINFOF controls protected areas, "Forest Reserves" and natural forest, relying on the regional brigade, a specialised control unit as well as its subsidiaries on sub-divisional level for this task (6, 5). On administrative level, the bureaucratic requirements for a private person to obtain a cutting permission for forest under state control are kept very high to discourage the exploitation of natural and non-private forests (5).

In promoting planting efforts, the MINFOF relies on various instruments. First of all, there are its own subsidiary structures of regional, divisional and finally sub divisional representations, called "posts". The posts provide technical assistance to farmers and grant subsidies or forward their requests to a higher administrative level (9). The posts also provide seedlings and engage in capacity building of local groups (5, 8). Posts sometimes work together with the "agric posts" the sub-divisional officers of the Ministry of Agriculture in case farmers are interested in agroforestry projects (5). Equally MINFOF posts are the contact persons for community forests and responsible for their control (5). Within this range of activities posts are to focus their efforts according to a work plan that is created on a divisional level and prioritising actions, e.g. forest protection, watershed afforestation, etc. (5). As another instrument, the MINFOF employs the ANAFOR, with the general objectives to promote the forestry sector, silvicultural capacity and planter networking and very specific objectives concerning the extent of the envisioned plantings.

Apart from its direct and indirect subsidiary agencies, the MINFOF uses direct funding to increase incentives for planting. In the course of the inclusion of councils into reforestation activities, MINFOF



especially contacts only certain councils directly, offering a lump sum per ha or number of trees planted. Due to this strategy, not all councils have been contacted or can apply and the selection process remains unclear (13, 5). MINFOF is also envisioning the councils as responsible entities for the management of the forest reserve plantations, to facilitate a better control and management through the local authorities as compared to the regional brigade (6). Overall there seems to be very little CSO cooperation despite continuous efforts by the CSO association NestCam (1).

MINFOF's relationship with SHs consists in the provisioning of services by the posts and by ANAFOR. However, these services do not seem attractive to most SHs and therefore have quite a small impact.

#### **4.2.3.3 Other Ministries' Strategies**

Other ministries concerned with tree planting are the Ministry of Environmental Protection (MINEP) and the Ministry of Agriculture and Rural development (MINADER). The latter is involved in tree planting in the context of fruit and cash crop trees and avoids entering the domain of timber trees in order to avoid conflicts with the MINFOF. The MINEP in contrast has plans to promote the inclusion of forest products into agricultural strategies via the domestication of non-wood forest products in cooperation with the World Agroforestry Centre (ICRAF). It also launches its own tree planting projects mainly for water catchment protection, biodiversity and soil rehabilitation, microclimate improvement and climate change mitigation. All activities are developed in order to have a strong publicity effect (8). The MINEP mainly works on the identification of environmental issues, control of private and public actors regarding environmental laws and sensitisation of the population about environmental concerns. Especially for the latter it cooperates with CSOs. They also make use of CSOs to influence higher administrative levels within the MINEP or other ministries, which would not be possible due to bureaucracy and the hierarchical structures.

The MINEP has practically no contact to SHs, but may facilitate the cooperation of public services and CSOs and research, being active in this domain.

#### **4.2.3.4 Government Strategy**

The importance of forests and environmental issues has been acknowledged by the Cameroonian government. Cameroon's forestry law is considered well advanced and Cameroon is involved in international negotiations on climate change mitigation and adaption. Along these lines, it is also running a publicity campaign on environmental action, like tree planting against desertification (1, 16, 18). Despite these very present demonstrations, people in the NW perceive little government action (1, 4, 16, 7) and wait for the announced support for reforestation efforts (21, 8, 18).

The government is often seen as hypocritical and opportunistic, for example allowing the profitable exploitation of lowland forests and prohibiting private use of natural forests (21, 7) (although in fact the legal tenure situation is more complex than that).

The effects of its commitment to decentralisation are hardly perceivable (1). The government is criticised for its centralised planning of large development projects that offer no inclusion of local stakeholders and often displace farmers (1). In general, an encouragement of large plantation activities, both in agriculture and forestry, can be observed (1, 15).

There are neither policies to foster ministerial cooperation with CSOs, which is therefore underdeveloped (1) nor a system for funding of individuals (15). Current cooperation policy in the forest sector is focussing on councils in the case of the NW region.

The government has implemented a system of competitive budgeting in order to increase productivity of the ministries. This means that the fixed state budget is being shared between the ministries according to the demands for projects each ministry specifies. This system is opposed to the former system of allocating fixed annual budgets to ministries (5).

Government action affects SHs indirectly via policies and especially regarding land use institutions on national and local scale.

#### **4.2.3.5 Sonel's strategy**

Sonel established in Cameroon in the course of the privatisation of the public electricity authority. Sonel is working on electricity production and –distribution. The distribution sector is particularly important as there are still not electrified areas in Cameroon and especially in neighbouring Central African countries that present a big market for electric infrastructure, i.e. electric posts. Therefore, the supply of the main input, eucalyptus stems, is a central concern for Sonel. Sonel is considering a safe wood supply the government's duty. Regarding available wood resources it is sceptic about the change in system, which now relies on private planting efforts with reduced government influence (24). Regarding the price of their input they have quite a powerful position as a monopsony and try to bind suppliers by demanding a very costly supply license (17).

Sonel's influence on SHs is unclear, as it does not directly purchase electric poles from SHs, but via middlemen, so that an increase of electric pole prices will not necessarily reach the SHs .

## 4.3 WHAT PROCESSES AND LEVERAGE POINTS?

### 4.3.1 Structures and processes that impact Smallholders' strategies

The existence of forests and trees in the NW is subject to different interests. Although many actors work towards increasing the number and area of forests, their specific interests which are often perceived as mutually exclusive can create conflicts and overlaps in the implementation of their respective strategies. This competition of approaches is aggravated by the small areas that are available for tree planting. Still, the different actors interact in order to fulfil their objectives. Considering conflicts, interactions are obviously more common between actors of common or similar objectives.

Cooperation also brings actors the opportunity to specialise their functions or operation area within a common strategy, reducing overlaps between partners. Conversely, there is also the case where actors are even dependent on cooperation due to their specialised function, e.g. the provision of funding. At the same time, cooperation is only attractive if the share of energy devoted to the area of cooperation adequately represents its importance in an actor's overall objectives (Ingram, Diestelhorst, & Ntiabang, 2007).

#### ***Actors and their relationships as processes***

The different actors involved in tree planting and wood production represent the structures as mentioned in the theoretical framework. Not all of the actors interact directly with SHs, but in any case indirectly by impacting other actors. The interactions of specific actors create specific outcomes, which are called processes in the theoretical framework. In this study, these processes describe, despite their name, static situations or topics, which are of importance for tree planting and wood production. In the following, relationships between actors are described under the process they can be attributed to. While some actors, especially ANAFOR and CSOs may be part of several processes, other actors like Sonel may not play an important role and find little mention.

#### ***Legal***

One actor that is especially impacted by policy is ANAFOR. ANAFOR's impact on the complex of reforestation activities is a product of its strategies and the assets it has available for pursuing them. Legally, reforestation activities and securing wood production are the sole responsibility of ANAFOR. After the liquidation of the ONAREF, the former public organisation for reforestation and branch of the MINFOF, ANAFOR is in charge of a broad range of tasks to strengthen private forestry activities and is directly responsible for increasing the area of private plantations. In contrast to the ONAREF that planted trees employing 600 workers nationwide, ANAFOR relies on the farmers' choice, investment capacity and workforce to plant. Fulfilling general objectives, like the building of a knowledge base and assessing the extent of private plantings and at the same time motivating farmers to plant, matching the large scale plantings by the government in size, is hardly realistic, especially in the face of ANAFOR's human resources of 6 to 8 workers for the whole NW region. Ambitious objectives and small number of

staff results in extension workers being unable to keep up with their work load and employing cheap workers or interns that may lack expertise or motivation to fulfil the given tasks to ANAFOR's standards (11).

On top of this, legislation is stipulating that ANAFOR be financially autonomous via the sale of seedlings and possibly acquisition of 3<sup>rd</sup> party funding (7). This gap between theory and practice is putting considerable pressure on ANAFOR and may result in a strategy towards meeting the indicators of success (i.e. area and seedling production) rather than the objectives themselves (i.e. sustainable increase of wood production). ANAFOR might be reluctant to enter cooperation where it assumes a rather indirect role because it aims to achieve “hard results”, i.e. plantations that are directly facilitated by ANAFOR and can be directly attributed to them.

A second actor group that is impacted by policies are CSOs. There is a large discrepancy between the officially recognised role of CSO work and their high local and regional appreciation. On the one hand CSOs work together with public services complementing governmental projects (8), on the other hand cooperation with public services is denied or flawed by corruption (1, 8). In the face of a shortage of public employees on the ground, the integration of CSOs to achieve common objectives would require an official recognition of their role of carrying out activities that are in the interest of the government or even reflected in its policies. Additionally, a formalised procedure of cooperation including control mechanisms would be needed.

Another impediment owed to legislation is the procedure of official land titling, because it is burdensome and expensive. Additionally, the overlapping tenure regimes on different levels, including informal and traditional rule complicate the acquisition and secure tenure of land. This prevents planting as it discourages farmers to secure their land (7, 21) and a secure tenure is a key requirement for long term investments such as trees.

### ***Administrative structures***

Ministries that do not coordinate their activities often find that their efforts are a duplication of work or that they have omitted topics they thought to be covered by another ministry. In Cameroon, conflicts between ministries can only be reconciled at the supra ministerial level by the prime minister's office. Complaints that are created e.g. at the divisional level are passed up the hierarchy, but seldom reach the prime minister for resolution. Instead complaints remain unanswered and conflicts unresolved (8). These conflicts usually take the form of interference with other ministries' responsibilities, because the fields of activities of each ministry as well as cases of possible or even of mandatory cooperation are not well defined (10, 8, 7). Where these interferences are avoided instead of used for the identification of possible cooperation, a holistic approach to land-use is no longer possible (10), because the realities of land use conflicts require a reconciliation of diverging interests in (at least) agriculture, forestry and environmental services.

The cooperation of ministries on regional level seems to be largely dependent on the personal compatibility of the delegates and subject to a certain rivalry possibly induced by the competitive funding system. Each year, ministries engage in this competition for funding at the annual budget allocation. Each ministry is trying to maximise its budget by projecting costly and ministry-exclusive projects, which prohibits a harmonised approach (5). As future funding is conditional upon the attainment of set objectives, strong pressure is passed down to the local subsidiaries (11, 7). The lack of cooperation between ministries for the formulation of objectives is therefore likely to endanger the larger objectives of each of them.

Councils find themselves more and more involved in typical MINFOF activities and the corresponding environmental responsibility. At the same time they are in need of money to embrace these activities (8, 7). The councils are the ultimate decision makers about land use on council land. Public services can only act as advisors to them and point out possible consequences of council projects. In consequence, councils may undertake projects that compromise the environmental objectives they have been entrusted with by the MINFOF, in order to generate funds, e.g. an urbanisation project in a watershed area (8). Similarly, councils are demanding a cutting tax from private planters, even for thinnings. This practice is highly discouraging for planters, as their profits melt almost to 0 (21, 13), but apparently it is necessary to fill the council's treasury. Councils are reported to suppress local CSOs whose projects or lobbying may endanger their revenues (1).

### **Information**

Information exchange between actors is of crucial importance for the success of tree planting programs, because of the many interdependencies between actors that take effect in this context. Information exchange contains, for example, the transfer of technical know-how and planning capacity, farmers' coordination for marketing, the sensitisation on the importance and various functions of trees, up to the assessment of the forestry sector and problem identification. Therefore a lack of information can have crucial implications for the dynamics of tree planting and its motivation.

#### **Technical knowledge**

ANAFOR is providing capacity building in seminars on tree plantation establishment and propagation techniques for CSOs and associations in order to promote good forestry practices (1), however not to SHs. Most people in the NW have gotten in contact with tree planting throughout their life and are well aware of the "traditional" practices that are commonly used by SHs. In fact these practices are not very different from techniques that are currently propagated by public agencies and CSOs, but training on planting techniques helped participants to better distinguish in which situation which practice is most appropriate (1).

Unlike for CSOs, ANAFOR's capacity building for farmers is often confined to instructions on planting at the nursery and not a continuous process (11, 7). Its capacity building of SHs is criticised as highly

insufficient (1, 4, 14, 18, 19). Not passing on knowledge in the course of the practical context of creating a plantation is a wasted opportunity in many ways. Firstly, a better understanding of natural processes and relationships can further increase SHs' motivation and success. Secondly, the farmer stays dependent on ANAFOR or MINFOF, which may risk plantation success if farmers cannot judge the health of their plantation themselves and fail to take measures. Thirdly, an ideal situation for "learning-by-doing" and deepening of silvicultural knowledge is left unused and fourthly can these farmers not serve as focal points for other planters and pass on their silvicultural knowledge.

CSOs make themselves focal points to provide silvicultural knowledge to individuals and private nursery owners. They entertain nurseries (sometimes with attractive species or advanced propagation techniques) to demonstrate presence and proficiency to potential planters and private nursery owners. These are to be attracted and come to the CSOs for advice (3, 5).

Local CSOs often have partnerships with international CSOs. These partnerships involve funding but also capacity building. This capacity building may be indirect via the provision of extensive literature or via direct training. This step is important, because projects that were designed by the larger partner CSOs have failed because the SHs lacked forest management skills and could not be instructed by the local CSOs. For the larger partner CSOs this highlights the importance of capacity building of local CSOs as a first step in implementing SH projects (2).

Most CSOs usually offer farmers advice for free (21), acknowledging that local capacity building and a farmer centred approach are crucial for project success (2). However, although most of them are (7, 22), farmers are not always interested in advice and do not see the need for more knowledge (1).

This situation is well known to the MINFOF posts, whose main activity is the provision of technical advice (5). In contrast to CSOs, the consultation of the post's services, e.g. for the planning of a plantation, is connected to fees. Therefore most farmers are reluctant to rely on the post's service in this context. They are mostly not aware of the potential benefits of the posts' information for their plantation, like reduced workload due to planting structure, faster production due to optimal planting distance, etc. and rather see the risk of costs, supervision and taxes than the possible advantages (6).

Still there are many information gaps in the field of forest management. Farmers, CSOs and public services alike are in need of experience with the cultivation and characteristics especially of native species to ensure their plantation success (1, 5, 8, 19, 22). Successful plantations of these species are seen as the basic requirement for the transition from the dominance of E in the forestry sector and towards more biological and product diversity and environmental services.

In order to professionally manage "Forest Reserves" and protected areas, councils need silvicultural and ecological knowledge (5). ANAFOR is interested in exact information on the status and development of planting efforts inside and outside its program (7). The profound silvicultural experience of middlemen is

currently not effectively shared with other groups (16). Altogether, there is the need for better exchange or fewer obstacles for information exchange between actors, as well as the creation of new information sources.

### Profitability and planning

Tree planting projects need to generate economic returns in order to be competitive with other land uses, e.g. agriculture and thus a viable alternative for SHs. Per stem prices of trees vary enormously. This is, for once due to the large difference of harvest dimensions (e.g. poles for scaffolding vs. timber for sawn wood), but in great part it also to the negotiation between buyer and seller. Prices may vary strongly for an E stem of a given dimension, especially for more valuable large diameters. Apparently, wood producers tend to generally accept proposed prices, partly because they do not know the value and partly because they prefer making a bad deal than no deal.

Knowledge about the market is not only important for selling, but already while planning the investment. The most fundamental decision, species choice, must depend on financial flexibility in terms of investment volume, because of different seedling prices and different periods to investment pay-out, i.e. rotation age. A particularity of wood production is the resilience of the investment against short term price fluctuations, because unlike annual crops, the harvest time can easily be postponed. This means that the risk of price fluctuations can be compensated with a high flexibility regarding the total investment period. Farmers may get advice on this topic from the MINFOF services at different levels (5). However, it remains unclear which amount of detail and which portfolio of options planters receive on this issue, whether there are minimum investment sizes for this service, or how much this service will cost the planter.

Information on project profitability and investment options is not only important for SHs, but also for CSOs, because financial stability is often a main concern. Even though they may demonstrate a high proficiency in silvicultural techniques, they often lack project management and business plan skills. These are crucial for the control of on-going projects as well as for the planning of new ones. Currently many CSOs are dependent on larger partner CSOs or public services for these tasks, which can create insecurity about the success of their strategy and reduce momentum for plantation projects (1).

### Sensitisation

Trees provide multiple services that range from fruits and wood over erosion protection to carbon sequestration. The importance of the more abstract functions is often not as well appreciated as the direct use functions like wood production and not considered by SHs in the decision for or against tree planting. Therefore, people that are aware of the full spectrum of services produced by trees have a higher motivation to plant, especially if the direct use values alone are not a sufficient motivation (15, 8, 19). The dissemination of environmental knowledge, called sensitisation, carried out by the public services, mostly MINEP, as well as CSOs has already had an impact in the NW. The opinion about the detrimental effect

of E plantations on water tables is widely shared. So is the consequent appeal not to plant E in wet areas (17). Given the importance of water on the one hand and the importance of the E on the other hand, the predominance of this issue is evident. However, it seems to push aside the range of other issues and possible benefits of trees which is why sensitisation by public services is to cover a broader spectrum of topics in the future (8).

#### Assessment of situation& info sharing

Currently there is no information system on forest surface and wood production, although harvested and sold wood is being registered by the MINFOF posts in the course of certifying the origin of trees and wood products that leave the sub-division. Equally the councils' cutting tax could be used to calculate the (officially) harvested stem number. The MINFOF is currently working on a system to supply this information (7). To which extent or detail this information is to be published is not clear at this point.

On regional level ANAFOR internally exchanges information about its various projects 3 times a year at their so-called coordination meetings with all extension workers. Each extension worker is to present progress, his/her particular strategy and encountered problems (7). ANAFOR has not yet been able to set up an instrument to assess the current state of reforestation beyond the observations of its extension workers and is struggling to do so considering that their current resources barely cover their narrowed focus (7). This lack of information also prevents an adaptation of its strategy to realities on the ground. In contrast, the MINEP is giving problem identification a high value, which often results in the identification of priorities on project scale (8).

The NestCam is connecting different CSOs in the NW. They consider their primary function to be an instrument for information exchange between members. NestCam holds ordinary meetings where member CSOs present their activities and problems, as well as extraordinary meetings on special issues in order coordinate activities regarding that specific issue. As another instrument for information exchange they are planning, is a regional observatory on land grabbing to which farmers or local CSOs can provide information(1).

### **Seedlings**

Seedlings are a major cost factor in the establishment of a tree plantation and therefore another key component for the motivation to plant. While some identify seedling costs at nurseries as prohibitive for an increase in SH tree planting (1), others attribute only small relevance to this factor (2, 16, 7). In fact the supply of seedlings is very much divided between E, the "classical" SH tree on the one hand and native and other exotic species on the other hand. Most private nurseries produce E seedlings, usually with seeds of local trees, whereas native species like *Prunus africana* and other exotic species like mahogany are offered only by few nurseries that have bought seeds elsewhere. Prices are consequently a question of species. In the current effort to promote native species and to reduce E's effects on soil and water by replacing it with other species, the high costs of just these seedlings is particularly counterproductive.



Almost as much as their cost, the low availability of seedlings is mentioned as a main obstacle to engage in planting. This shortage has the dimensions of quality and quantity (the following specifications on quantity refer to the quantity of E seedlings only). Especially large projects >0.5 ha (corresponding to >5,000 seedlings at a typical 1x1m planting distance) require a number of seedlings that is often hard to find locally (18, 19). However, this may be a result of common demand patterns that usually involve smaller planting projects or even of local variation in supply, as others deny a shortage in seedlings (17, 8). Unchallenged in contrast, is the unavailability of all non-E and even E seedlings of certified quality (2, 2, 11, 8, 18, 19). In consequence there are reduced options for CSOs and SHs concerning the role of trees in their livelihood and land-use strategy, which may result in less motivation to plant or worse, a species choice that does not match their real demand as this would create negative experience and manifest SHs scepticism or reluctance to plant these species.

Tree nurseries are operated by different actor groups. The public services MINFOF, ANAFOR and Minader each have their own tree nurseries. CSOs and individuals are also engaged in nurseries. The range of species offered by CSOs is wide, but mostly depending on their specific orientation. They focus mostly on native species or those that provide specific environmental services like watershed protection, alongside with agroforestry and fruit trees and even E. Private nurseries offer almost exclusively E and sometimes fruit trees. The array of seedlings the various government nurseries offer is very specific to their branch. ANAFOR is focussing on timber and ““water friendly”” species, the MINFOF posts also offer timber and “water friendly” species, along with medicinal and fruit trees, while the minader is offering everything but timber and native species, i.e. fruit, cash crop and agroforestry trees (1, 10).

Some SHs, CSOs and ANAFOR extension workers advocate the distribution of these more expensive seedlings to farmers free of charge to make them more popular (1, 2, 11, 19). Subsidising these seedlings will, however, decrease the incentive of private nurseries to adopt these species, as customers will prefer the cheaper or free subsidised seedlings. Already now private nurseries lack profitability (11) as well as knowledge and funding (7) to develop themselves regarding quality, capacity and species offer. The pressure on private nurseries through the subsidised seedlings from public services is widely recognised. However, public services still largely continue to offer seedlings at low rates (15, 2, 13, 5). It remains unclear, why some MINFOF posts discontinue their nurseries to promote private nurseries, while others continue to give out seedlings (3), or why there is financial support to private nurseries by the MINFOF only in some places (3). SHs and CSOs often create nurseries just to provide seedlings for their own plantation projects (1, 21). While SHs usually restrict the production of seedlings to their own demand (19), some farmers and especially CSOs produce beyond it and sell the surplus (1, 8), although often with a more philanthropic than economic motivation (1).

## **Funding**

The large number of actors that is trying to promote tree plantings is not necessarily an indicator for their success. Their impact will depend on the conception and success of their individual projects, which in turn largely depend on the funding these actors have available.

Many CSOs receive funding on a very irregular basis. This can lead to great personal investment of the members especially in smaller CSOs (1, 4). The CSOs struggle to advance their objectives, to break even with their investments and to keep their organisations alive and attractive.

After a crash of agricultural prices in the 1990s, the public agricultural development and research programme was cut rigorously. Today, there is little awareness by farmers on the services and opportunities related to these government institutions (18) as a consequence of the small number of employees and graduates and thus a missing contact to farmers in the fields. This could have contributed to the reduction of innovation and entrepreneurship that can be observed in the sectors of forestry and agriculture over the last 20 years (21, 19).

Analogously, ANAFOR's regional direction and extension workers are well aware and complaining about the lack of funding and personnel considering their objectives (11, 12, 7). The ratio of about one extension worker per division (or on average per 2 500 km<sup>2</sup> or 150 000 rural inhabitants (INASTAT, 2012)) may serve as an illustration of the current situation.

### **Uninformed or populist allocation of funding**

The main sponsors of tree planting projects are the MINFOF and large CSOs or international aid/development cooperation organisations (1, 5, 7). Concerning the allocation of these funds, especially small CSOs feel omitted (1). Funding organisations seldom check the competences and experience of their applicants (1, 15, 13, 5, 6, 19), except for small CSOs that are also compelled to undergo a thorough check by the public authorities and corresponding bureaucracy (1, 5).

The reason for allocating funds mainly to larger CSOs may be explained by the reduction of transaction costs they can offer as compared to the smaller CSOs. Charging one CSO with the reforestation of 10 ha instead of 10 organisations with 1 ha each reduces transaction costs for donors considerably. Additionally, large CSOs can offer a higher quality and extent of administrative resources. Fast and "donor-tailored" project proposals, experience with fund acquisition and national bureaucratic processes (1, 13), reachability and possibly political influence give large CSOs a decisive advantage over smaller ones. These in turn are not contacted or not even recognised by the donors themselves, but donors may oblige the large CSOs to include them in the project. However, this system barely works. If smaller CSOs are included, they are often taken advantage of and not paid adequately (1, 21, 19).

Funding organisations of all of the above mentioned backgrounds have been accused of choosing to fund only organisations that can either be used to their advantage in their political or publicity campaigns or

those that are powerful lobbyists and can give political support to their donors, i.e. large CSOs and ministries (or ministers) (21, 4, 13). Notably, these practices are distinct from the, in many cases wearily accepted, corruption (1). Corruption risk is the reason why some applicants ask for funds in the form of material right away to prevent embezzlement (13).

The funding organisations are also largely operating independently, so that there is no concerted effort to focus on one aspect of priority. Contrarily, funding of different organisations is often overlapping (7).

### **Control**

The efficiency of funds is intrinsically linked to their control. Weak control mechanisms often lead to a less specified use of funds. The absence of control may even motivate to not carry out the projects at all. Among CSOs in the NW, some have been accused of embezzlement. The tactics are so called “paper projects” that only exist in the status reports of the CSOs that justify their fund use. Notably, many CSOs that are conducting fraud in this way, did have projects before, but found there was no need to continue the project in order to receive further funding, because their efforts were not controlled on the ground (1). Often other CSOs notice a divergence between real and presented projects of their fellow CSOs and consequently their embezzlement. However, it is ignored by most other CSOs that also hope to profit from funding in the future and want to “grow into” the respective structures, or only criticised by small CSOs that do not have the power to make these cases public (1, 2, 4). Consequently, there is no effective voluntary control between the CSOs concerning fund use, even though information on correct or incorrect fund use is (informally) available. However, there are networks of CSOs that cooperate for information exchange and mainly for lobbying and acquisition of funding. One network is NestCam, the Network of Environmental Stakeholders Cameroon that links several CSOs from the NW. Its meetings involve the regular presentation of current projects of each of the members and therefore have a limited control function, but the network does not conduct control on the ground due to a lack of resources (1).

The control of projects on the ground is rather the responsibility of the respective donors. In the NW, these controls of projects rarely involve their inspection in the field, as these are deemed too time consuming, considering the number of projects and their often remote locations (1, 2, 21, 4, 15). An outstanding lack of- or laxity in project control is reported from the central ministries, e.g. MINFOF, that has additionally been suspected of embezzling funds within their own agency even before they reach the beneficiaries (1, 4, 15).

### **CSO Network**

There are a very high number of organisations and networks in the NW region. There are several incentives for individuals or organisations to join an association. One is the access to information and social contacts to improve the members’ individual projects. Another is that groups are more powerful in conflict situations with other organisations and especially public authorities (1) and find it easier to acquire funding. Organisations in the NW are grouped on different levels and in different forms. A

broader objective will give the network the possibility to unite more organisations under its banner, but will at the same time have to reconcile diverging opinions on more specific issues. If the network's objectives are not in line with the objectives of its members it will very fast become unattractive and ineffective (1, Ingram, Diestelhorst, & Ntiabang, 2007). Often CSOs unite many Common Initiative Groups (CIGs) in a network, so that barely any small organisation is not networked on a higher level. Still, existing networks rather connect organisations from the same areas than those with the same interests on a larger scale (1, 4).

### 4.3.2 Possible cooperation to increase effectiveness of reforestation efforts

#### **Cooperation**

Many different actors are aware of the important role of trees and wood production in the socio-economic and environmental context of Cameroon's NW region- or just in the context of their own livelihood. Their objectives are very diverse, even inside the same actor groups. Still, there are many common objectives across actor groups, but then again the egocentric strategies lead to a duplication of efforts and stand in the way of a meaningful cooperation. The considerable capacities that are present in the form of CSOs, various government agencies and the private sector fall short of their potential, because there are little synergies between these actor groups. As cooperation requires the pursuit of a common goal, cooperation may only be possible on the most fundamental common ideas. Meaningful cooperation with a great potential in the case of reforestation and wood production could encompass the areas of information exchange and capacity building, seed systems and funding- and control mechanisms.

The cooperation with CSOs constitutes a special opportunity in the NW region, because of their large number (see Table 5 for a non-exhaustive list of NGOs and CSOs) and potential effect on the ground. The CSOs often already have a strong capacity in their respective work areas, so that institutional strengthening and adapted objectives present the larger challenge (Neba, 2009; Ingram, Diestelhorst, & Ntiabang, 2007).

Table 5: Incomplete list of NGOs, CSOs, Ministries and international organisations active in the fields of agriculture, forestry and development in the NW region. The numerous organisations on village level are not represented in this list and make up the majority of CSOs in the NW. Sources: Neba, 2009; Chang, 2012, WANGO, 2013; Schlieper, 2013 (SSI)

Actor type	Name
NGO/ CSO	Action pour un Développement Equitable, Intègre et Durable
	Association Camerounaise pour la Santé et le Développement.
	Association Française de Volontaires de Progrès
	Association for Creative Teaching
	Association for Humanitarian Actions (AHAYE)
	Association pour la promotion des Initiatives Communautaires Africaines
	Bafut Valley Development Organisation
	Bafut Village Community Project

Better World Foundation Cameroon
Belo Rural Development Organization
Cameroon Baptist Convention
Cameroon Cooperative Credit Union League
Centre for Appropriate Technology - CAT Cameroon
Circle International pour la Promotion de la création
Comite Diocésain de Développement et d'Activités Socio Caritatives
Community Agriculture and Environmental protection Association Cameroon (CAEPA Cameroon)
Community Development Volunteers for Technical Assistance (CDVTA)
Eddy Hope Foundation (EHF)
Eglise Evangélique du Cameroun
Enterprise Development & Governance Facility (EDGF Cameroon)
Environmental Protection and Development Association (EPDA Cameroon)
Financement d'Investissement de Micro-realisation Agricoles et Communautaires
Forest and Agroforestry Promoters
Foundation for Environment and Development (FEDEV)
Green BackYard Cameroon
Green Belt Common Initiative Group
Health Care and Environmental Sanitation Association
Home Based Care
Hope Foundation
Institut Africain pour le Développement Economique et Social
International Children's Welfare Foundation (ICWF)
Mission de Développement de la province du Nord-Ouest
Mushroom Production Training and Research Centre
Navti Foundation Kumbo
NDEF Cameroon National Development Foundation
North West Cooperative Association
North West Cameroon Association of Development Organisations (NWADO)
North West Farmers' Organization
Ntambang Brothers Integrated Development
Nuyere Esther Foundation
Organisation for Rural Infrastructure, Community Animation & Afforestation
Organisation pour le Développement Rural et Reboisement
Paradise on Earth
Permanent Farming Systems and Animal Traction Project
Presbyterian Church in Cameroon
Programme de Développement Communautaires
Provincial Social Marketing Programme
SAILD Bamenda
Strategic Humanitarian Services in Cameroon (SHUMAS)
Self Reliance Promoters NGO

	Service d'Appui aux Initiative Locales de Développement
	Sharon RTC
	Society for Initiatives in Rural Development and Environmental Protection
	Sustainable Agriculture and Self-Help
	Sustainable Integrated Balanced Development Foundation
	Sustainable Livestock Foundation
	TechCeFaCos Group
	The Research Centre for Peace Human Rights and Rural Development (REPERID)
	Volunteer Group for Agro-Silvo-Pastoral Development
	Youth Agriculture and Development (YAD)
	Youth Concept Forum Building Aspiranse
<b>Ministry</b>	Ministry for Agriculture and Rural development
	Ministry for Environmental Protection
	Ministry of Forests and Faun
<b>International Organisation</b>	ICRAF
	Food and Agriculture Organisation of the United Nations
	German Society for technical cooperation
	Heifer Project International
	Netherlands Development Organization
	Swiss Association for Development Cooperation
	United Nations Volunteers-Domestic Development Services.

## Seed

The access to high quality seed material is a key component in making forest related activities - from monocultures to agroforestry- attractive and economically viable for SHs, because the variety of species and their genetic potential largely determine the quality and quantity of products that can be obtained and therefore the utility, SHs can derive from their trees.

For any large scale effort to promote tree planting, it would be crucial to provide SHs with access to quality seed material. The utilisation of germplasm that does not have the potential to fulfil the planters needs, e.g. at least 30% stems of good commercial quality or 100kg fruits per year, may be generalised by the planters and make them abandon trees from their future livelihood strategies. Maximising SHs' utility from the trees in order to meet or surpass their expectations will create more confidence in this investment and serve as motivation to include trees into their future livelihood strategies.

In order to create a broad change in forestry culture in order to diversify rural livelihoods and counteract environmental effects of the E's dominance in the NW landscape, current efforts mainly try to motivate SHs to move beyond E in their tree planting projects. Having said that, SHs' choice for E is not purely a matter of species preference. The fact that the supply of seedlings is mostly restricted to E plays an

important role, as this does not reflect the demands of the population. Other seedlings are either not available locally or their prices are prohibitively high for SHs (Degrande et al., 2012). The effort to supply species that can meaningfully complement SHs' livelihoods in providing different goods and services has been pursued by the creation of ANAFOR and MINFOF nurseries. However, even the subsidisation of these species has not made them affordable to most SHs. On the contrary, the subsidised seedlings compete with private nurseries that are in consequence reluctant to offer them. This leads to a centralisation of these non-E species in the hands of public services and some few CSOs. Making them available to SHs may involve further subsidising the seeds, as advocated by ANAFOR, but the current strategy to create a dependency of farmers towards their agency is counterproductive to their motivation (and may be a result of ANAFOR's pressure to present success). The supply of non-E species must be expanded to private nurseries and subsidies must go to these private nurseries, in order to ensure a sufficient supply to farmers (3). In this context, ANAFOR's role could be the supervision and capacity building of these private nurseries via cooperation with CSOs.

ANAFOR expressed a concern about the quality of E seed material that is used by private nurseries, because it may not be selected regarding growth characteristics of the parent tree. Trees of bad commercial quality, e.g. with low branches or curved stems make forests fall short of their potential economic value. Apart from ecological viewpoints (which are not a main concern in E production anyhow), good commercial quality is very important especially for the planter. To increase the amount of good quality seed material, private nurseries need an incentive to make the effort to choose good parent trees, possibly capacity building to do so and cooperation with middlemen, that are the key actor in harvesting and thus access to seeds (11). Additionally, middlemen are very knowledgeable about the commercial value of stems as well as most other silvicultural aspects (16).

The provision of seeds has a high potential to promote the forest sector in securing the success of tree plantations and therefore the benefits for SH and the permanence of the role trees can play in the landscape of the NW region (Degrande et al., 2012). Beyond that, it is a crucial precondition to move beyond the dominance of E and towards a more diverse landscape that can provide multiple goods and services. In this regard, the provision of seeds and the development of a system of cooperation have a great potential to promote the forestry sector (Gyau et al., 2012; Lillesø et al., 2011a).

In such a seed system, the seeds would be obtained by a government agency as well as private actors to be ultimately distributed to decentralised private nurseries. Although work is shared between public and private actors, the involvement of the government is needed particularly for the identification of seed sources and reduction of obstacles to an efficient supply chain (Lillesø et al., 2011a). CSOs and government agencies would provide capacity building to nurseries on the one hand and to planters on the other hand. This commercial, decentralised model is considered more promising than a centralised,

government directed approach, complete reliance on CSOs, or approaches with farmer-to-farmer diffusion (Lillesø et al., 2011b; Böhringer et al., 2003).

### ***Obstacles to planting***

Motivating SHs and associations to plant involves reducing the obstacles that impede their initiative. In the case of farmers with scarce land resources, a main obstacle is the forgone agricultural production from the land used for planting. Therefore ANAFOR is searching for a way to substitute this production with funding to farmers (7, 18). Agroforestry practices represent an important approach to solve this problem, but can often only reduce it. ANAFOR is envisioning a payment scheme to SHs, rewarding them for each year their plantation survived and thus compensating them for the foregone revenue from agriculture (7).

A different approach is to reduce the costs for SHs by funding the plantation establishments. Currently CSOs carry out this activity, often facilitating the participation of farmers in international donors' programmes (2). Increasing the efforts in this approach would either require the increase of public service personnel on the ground to organise and provide the funds to SHs, or the cooperation with CSOs in promoting a common approach from a common donor. This would in turn require a reliable mechanism to control the use and allocation of funds.

Another large obstacle, the uncertainty of wood prices or profitability of the tree plantations could be approached similarly by price guarantees. Both approaches involve considerable administrative efforts and represent a strong responsibility of the government or public services.

The overlapping tenure regimes and the various institutions of land use rights in the NW, which can also be observed in the rest of Cameroon (Gyau et al., 2012; Ingram et al., 2013) and in many sub-Saharan countries (Le Roy et al., 1996), add to the heterogeneity of local conditions, complicating the implementation of a concerted approach to promote the forestry sector, especially tree planting (Gyau et al., 2012). Therefore, another important challenge is the harmonisation of tenure regimes, which would provide SHs with more planning security and possibly access to more land and thus fulfil an important requirement to engage in long term land-uses like tree production (Le Roy et al., 1996).

### ***Information***

The starting point for any planter is the knowledge about the potential benefits of the plantation. Given the strong differences about what is perceived as a benefit, information about the benefits of tree plantations must encompass the whole spectrum of tree functions. Especially for SHs, the potentially largest group of planters, information about tree planting must not only present the different benefits as separate options, but needs to demonstrate the possible combinations of different benefits to a farmer. In this regard, the different approaches pursuing only one trajectory, e.g. Minader with fruit and AF species, environmental CSOs with "water friendly" species, etc., are conflicting, if the promotion of sustainable



reforestation and wood production are taken as a target point. The less a tree plantation project will be adaptable to a farmer's demands, in terms of size, investment, benefits and flexibility, the less likely is it to be a viable supplement to his livelihood strategy. For this reason, it would be important to supply the complete spectrum of possibilities to farmers when informing them about tree planting projects.

However, as a first obstacle, there is a lack of information on these different possibilities.

Recommendations are based on generalised statements depending on the actor providing them. The state of the art in transparency is an exemplary cost calculation for a 1 ha plantation by ANAFOR, an option that is obviously unattractive to the majority of farmers. The next obstacle is a lack of human resources to explain SHs the different benefits and portfolio options. Considering the large number of organisations working on the subject of tree planting, there are many people that could work in this function, given that they can be mobilised. This in turn would require involving them in a network. A network for information exchange can have hierarchic as well as decentralised functions. The hierarchic function would be used to ensure a common strategy as a starting point, by communicating common methods to the members. At a decentralised level, experiences and specific projects could be collected, made public and shared within and beyond the network.

Therefore, there are two types of information that is to be shared within such a network. One is information created by a commonly accepted, knowledgeable (research) organisation, such as guidelines, portfolio options and consequences, best practices etc. This information would go downstream via mid-size CSOs, small CSOs and finally to the farmers or other planters. The other type is created in the field by all other actors and involves their experiences with applying the practices proposed by the research organisation. Both types of information require effective structures in order to flow swiftly. Capacity building that is to reach as many people as possible can make use of a pyramid system (1). This means teaching the leaders to be teachers for their respective organisations. Adding a level would make the members of the organisations to teachers for other groups or farmers. The amount of levels feasible will depend on the complexity of the content and how much time can be spent for the training. The advantage of having many knowledgeable persons is to have a tighter support of planters which can increase both planting success and also the planters' understanding about tree planting techniques (1). Successful planters can then be a source of capacity building for other potential planters (11, 8, 7, 6).

The reporting mechanism needs to reflect the current status of the joint efforts. Therefore a set of objectives as well as criteria for success or failure needs to be developed. Whether and to which degree the analysis of success and its factors is to be conducted by the data collecting (CSOs) or the central level (network administration or research) must depend on their respective resources available. In any case, CSOs will need skills that go beyond silvicultural knowledge if they are to be a functional part of such a system. These skills include especially reporting skills for collected data and planning and organisational skills for the dissemination of capacity building and to draw SHs' interest (1).

As a tool to identify the situation, problems and decisive factors for private tree planting, a database of all the plantings realised by the network could be created. It should also include the status or success regarding the envisioned goals. This way, the multitude of choices for planting projects regarding area, species, soil, etc., could serve farmers by making the various planting projects more transparent and tangible by giving them an idea of success rates regarding the envisioned goals and putting them in contact with someone who already planted for experience exchange. Researchers would have access to a broad data set that could be tested for accuracy and used for livelihood studies and the role of trees, information that would feed back into the formulation of objectives. This database could be integrated in a public information sharing platform for planters, potential planters and other stakeholders and could itself contribute to performance increase of plantations, networking and innovation (Adjei-Nsiah et al., 2013).

On governmental level, a platform for information exchange about the activities and objectives of the respective ministries is needed to avoid further duplication of investments (7).

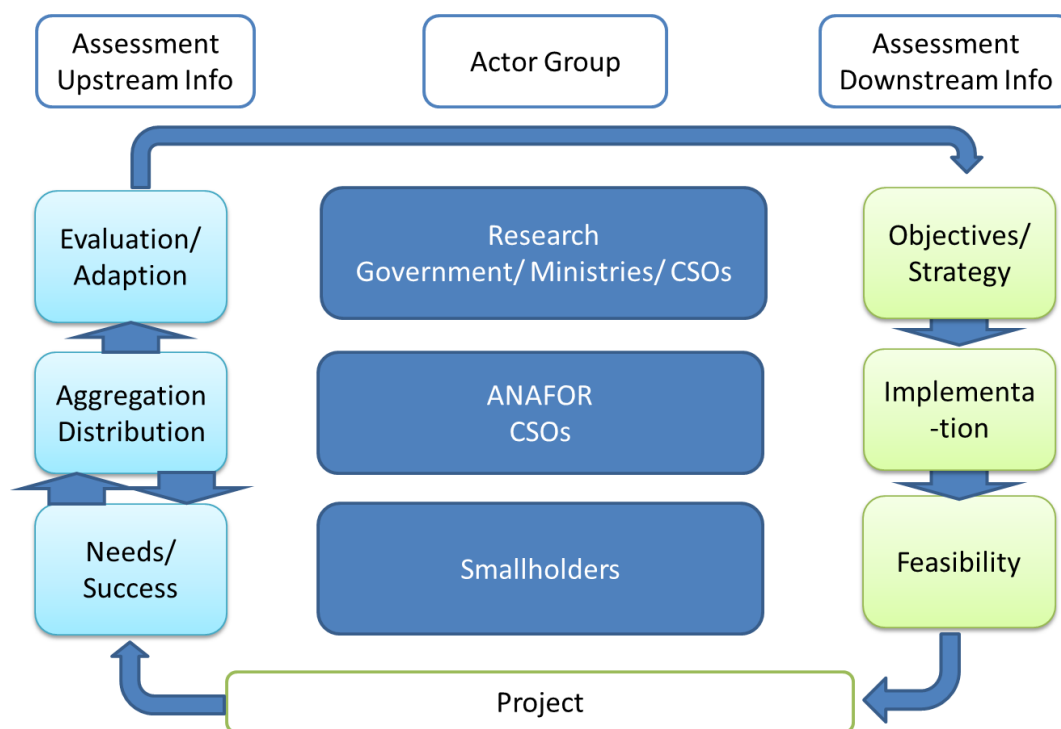


Figure 10: Illustration of main fluxes of information in a multi-actor cooperation for information exchange

### **Multi-level network**

An efficient cooperation of actors interested in wood production and tree planting could advance the forest sector in the NW considerably as compared to individual approaches. However, there seems to be a large gap between potential and feasibility.

For ANAFOR in their role as legally responsible institution for reforestation, most important activities would consist of fundamental functions in conceptualising and coordinating planting promotion in the NW.

ANAFOR will need to serve as a link between actor groups that are on two levels “above” and “below” in terms of contact to SHs. The level above includes ministries, international donor organisations, etc. and the ANAFOR itself. Ideally these actors would harmonise their objectives in cooperation with and on the basis of information by research organisations. The level below would comprise CSOs that stand in contact with SHs to work on problem identification, capacity building, follow up of plantation projects and control and reporting (1, 2, 18). This proposed structure has also been mentioned as desirable by CSOs and public services alike (21, 4, 8, 19, 6). There seem to be two main obstacles to the implementation of such a structure. One is a lack of funding for its establishment and the support of CSOs to comply with their role on the ground. The second one is the organisation of CSOs in groups with common objectives. A fundamental requirement for the stability of such networks is a common goal and priority (Ingram, Diestelhorst, & Ntiabang, 2007), which is a challenge given the diversity of CSOs in the NW (Ingram, Diestelhorst, & Ntiabang, 2007, 1, 21).

Despite these difficulties, an emphasis on creating synergies between actors is likely to yield better results for SHs and the forestry sector, than approaches that disregard the diversity of actors and complexity of individual goals. Innovation and progress towards satisfying the multiple demands for tree products and environmental services requires the networking of institutional actors, which holds a great potential, because they can reduce negative external influences for SHs and create conditions that enable them to capitalise upon their assets more efficiently (Adjei-Nsiah et al., 2013; IIED, 2012). In the networking of SHs the evolution of tree grower groups may play an important role, as the representation of SHs’ goals, usually by local associations or village representatives with a multifaceted foci, may put forward general claims and preconditions for cooperation, but may not be able to specifically identify specific measures and pathways for a beneficial advancement of forestry from the viewpoint of SHs, simply because they lack specific expertise. SHs associations, established for joint management purposes may be much more successful in identifying and communicating pathways on landscape scale than associations with a broad focus or individual forest owners. The organisation of private forest owners often reduce costs for its members (Kittredge, 2005), which is probably why it has also been observed in the NW (16). This organisation may still increase, given a critical mass of forest owners exists locally to initiate such organisation and membership remains profitable. Additionally, the increasing organisation of this group is subject to the benevolence of the government, which is not self-evident, as organisation results in a stronger negotiation position (Glück et al., 2010; Ingram, Diestelhorst, & Ntiabang, 2007). However, given the large ratio of SHs that have trees (81%), tree producer associations would in fact be subject to a high diversity of interests, which would give their negotiation power a backdrop. Still they would be an

important focal point for technical knowledge and education and interface with capacity builders (Rickenbach, 2009; Van Gossum et al., 2005).

### 4.3.3 Trajectories

The advancement of the forestry sector in the NW, under consideration of the demands of various stakeholders, especially the rural population, could benefit from a joint effort of the current actors. However, this joint effort requires an a priori a well-defined objective and a clear trajectory of institutionalisation that sets a framework of the possible roles of each actor. The commitment of the Cameroonian government is as crucial as uncertain, considering that it will have to step up its efforts. In ensuring the efficiency of a cooperation, the different actors of the cooperation rely on the decentralised public and law enforcement services to ensure tenure and use rights upon which the design of the approach is founded. This may require institutional strengthening and capacity building on local level (Ros-Tonen et al., 2008), which can also be a pathway to strengthening local governance (Andersson, 2013; IIED, 2012). Beyond providing this basic infrastructure for a multi-actor cooperation, the role of the government in directing the trajectory of the cooperation in defining boundaries or by determining its level of involvement as an actor is also a crucial but uncertain component.

The state may decide to engage directly in order to reconcile various demands on land via spatially differentiated land-use planning. Spatially differentiated land use planning is a concept that aims to balance the demands for production and environmental protection in a way that is most efficient on national, regional and divisional scale. It involves the zoning of land in areas of intensive production with no environmental constrictions, various types of conditional production and areas reserved for protection depending on their potential to provide environmental services. However, the concept is distinct from a mere distribution of responsibilities between public agencies for the respective zones. On the contrary, it puts forward the importance of the adaptation of the environmental zoning to the natural condition (and potential condition) of the zones, which requires a holistic view of the regional conditions. This holistic view in turn requires a strong role of public services in planning, supervision and strategy development. In the case of the NW this would mean the development of institutional capacity, including an increase in the number of staff. An additional requirement would be improvement of inter-ministerial cooperation. These demands on public administration would however contradict the government's current strategy of reducing public servants and emphasising the role of the private sector for development. Cameroon's efforts to reduce government intervention and to strengthen the role of the private sector in the course of complying with recommendations from the World Bank make a build-up of institutional capacity and the creation of additional structures seem very unlikely.

The alternative to a strong role of the government in land use planning would be the use of local structures for the identification of problems and suitable land use types for each area. This in turn

requires a representation of all different interest groups, if the outcome is to be equitable. Who is to represent SHs in this process, poses another challenge and stresses the importance of independent entities that supervise the process (Ros-Tonen et al., 2008).

But then there is also the question whether this process of stakeholder coordination can yield constructive outcomes due to overarching constraints like conflicts beyond the domain of land use like culture or class or whether those actors are to be supported that are capable of initiating change towards a common goal (see Mermet, 2011).

In creating alliances and networks for the promotion of forestry and tree planting, especially in the context of information dissemination, seed systems and control and funding, it is uncertain whether the various actors that are present can be motivated to cooperate. As mentioned above, a common goal and common interests are decisive factors in this regard. In any case this process will not come about without conflicts and is subject to building trust between actors, which is why long-term commitment of the participants is needed. For facilitators of the cooperation, this means engaging possibly beyond normal project time frames (Ros-Tonen et al., 2008).

Providing information, seed and funds for SHs and thus increasing land use options would create a win-win situation, given that all the participating actors perceive the common goal as paramount, which seems especially difficult for CSOs. Whether the formulation of a common goal or even the creation of a holistic portfolio of land use options is realistic remains questionable. The priority should therefore be a harmonisation of the objectives of the level above ANAFOR, including the various ministries, donors and research organisations. This way, ANAFOR could at least promote an approach to developing the forestry sector that does not conflict or compete with other efforts and does not come at the cost of SHs and the whole of the rural population.

Despite the challenges to reconcile diverging interests on land use, the forest sector of the NW region holds an important opportunity for development. The economic growth of Cameroon and its neighbouring countries could create strong incentives for production increases, especially in developed, anthropogenic landscapes. The political stability and the presence of CSOs could contribute to the inclusion of sustainable production and land use development in this process of development. These structures and possibly networks could help to minimise the negative effects on the local population from providing environmental services to the public and the economic growth could maintain the momentum for the transition and development of the forest sector. This potential makes the development of forestry and wood production in the NW particularly interesting.

#### **4.4 Reflective statement**

Considering the variety of aspects taken into account in this study, it was only possible to provide an overview of the main relationships in the promotion of tree planting, which is mainly owed to the design

as a scoping study. Concerning the role of SHs, a more detailed analysis of their situations and the importance of external factors could have better highlighted the effects of actor cooperation or characterised the diversity of current efforts on the ground. A detailed analysis of legislation and strategy papers as well as interviews with high ranking officials could have sharpened the image of legislation constraints. For the studied aspects, the chosen methodology has proved as useful to capture much variety and variables in the given time and especially considering the scale of the study area and provide raw data beyond the scope of the study.

Further research is needed on the feasibility of multi-actor approaches and the formulation of common goals and networking in this regard. At the same time it is important to identify obstacles for the harmonisation of government and donor incentives.

## 5. CONCLUSION

The development of tree planting and wood production in the NW region includes interactions that are of high relevance to research. SHs that represent the most important group for wood production are a key component in developing the forestry sector. With a higher incentive to plant trees, the contribution of SHs to the increase of forest area and the provision of timber and environmental services would be significant. On the one hand, motivation to plant depends on the individual situation of each SH that determines the possible benefits it could bring compared to other land uses. On the other hand there are many other actors interested in the development of the forestry sector and that cooperate with farmers to reduce obstacles to their planting. However, none of these actors have the capacity to support SHs in a way that ensures the long term success and multilateral benefits of their plantations. There is a great potential for cooperation under which these actors assume specific roles on different levels and thus capitalise on their strengths. A cooperation could satisfy fundamental needs in the promotion of the forestry sectors, especially for the provision of seed material and the exchange of information. However, actors often compete prioritising their own structures and emphasising their own importance in search of funding. They often perceive their own interest as too distinct to enter cooperation. Therefore, the formulation of a common goal would be the requirement for a functional cooperation. Considering the central role of SHs in the forest sector, the development of an approach that aims to enhance the attractiveness of trees to them would be highly constructive in advancing the forestry sector. Taking the various roles of trees in the livelihoods of SHs as point of departure is important. It ensures the inclusion of HHs that rely on their land for food production and would only plant a few trees. In the E dominated landscape of the NW, SHs are often not even aware of the potential benefits of trees so that the provision of information about plantation options would be a first step in increasing the attractiveness of trees. A

second step would be to ensure the availability of the desired species. Although these reflections seem fundamental, their expansion towards a joint approach of actors presents a considerable challenge. Identifying and overcoming the obstacles to cooperation is therefore a key component in liberating the large potential of the NW's forest sector to contribute to wood production, the provision of environmental services and increased well-being for SHs. Implementing a meaningful cooperation between actors to promote SH forestry would also serve as a point of reference for other regions and thus contribute to the development of SH forestry regimes that provide significant benefits to the rural populations elsewhere.

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## 7. ACRONYMS AND ABBREVIATIONS

ANAFOR	National agency for the support of reforestation
CGIAR	Consultative Group on International Agricultural Research
CIFOR	Centre for international forestry research
CSO	Civil society organisation
HH	Household
ICRAF	World Agroforestry Center
MINADER	Ministry of agriculture and rural development
MINEP	Ministry of environmental protection
MINFOF	Ministry of forests and fauna
NGO	Non-governmental organisation
ONAREF	National organisation for reforestation
SH	Smallholder

## 8. TABLE OF TABLES

Table 1 : Coordinates of study sites for questionnaire surveys. Source : Google Maps, 2013 .....	10
Table 2: Main products and prices of E. Source: Schlieper, 2013 (SSI).....	16
Table 3: Exemplary cost/ revenue calculation of electric pole provision (17). .....	16
Table 4: Observed and reported species in the NW .....	19
Table 5: NGOs, CSOs, Ministries and international organisations .....	47

## 9. TABLE OF FIGURES

Figure 1: Simplified graphic of the adapted Sustainable Livelihoods framework. ....	6
Figure 2: Location of the NW region .....	7
Figure 3: Satellite image of one of the study areas (Kikaikom). ....	11
Figure 4: Forests in the NW region .....	14
Figure 5: Scheme of land use in Cameroon's West region.....	18
Figure 6: Land use in one of the study sites (Binka): .....	18
Figure 7: Initial reasons for planting. ....	29
Figure 8: Reasons for not planting more trees.....	30
Figure 9 : Species planted by respondents in all 3 villages .....	31
Figure 10: Illustration of main fluxes of information .....	53

.....

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.....

# 10. ANNEXES

## TABLE OF ANNEXES

Annex 1: Interview guide SSI.....	64
Annex 2: Household Questionnaire .....	71
Annex 3: Transcripts of Semi Structured Interviews .....	79
Annex 4 :Questionnaire survey Analysis data .....	137

# Annex 1: Interview guide SSI

Date

Name

Function

## 2. Characterisation of plantation initiatives

Place, Date estd (end), Name of program, difference to other programs, rationale

What is the name of the plantation initiative?

Where is/ are the plantation located?

What is the difference to other programs?

Why was the initiative started?

Why here?

Specific objectives: products, services

What are the goals of the plantation?

What should the plantation provide?

Which products are to be derived from the plantation?

Examples for objectives, products/ services:  
fuelwood, construction wood (2x6, planche, poles),  
electric poles, research, soil restoration, watershed/  
soil protection, landslide prevention

Surface, Species, terrain

What is the surface of the planted area?

How do you know?

What species have been planted?

Which terrain was planted?

Which species survived? Which grow best where?

## 3. Ecology and silviculture, knowledge and interaction

Silvicultural practices, nurseries, site preparation, planting distance and technique, follow up, etc

How did you go about when you started planting?

What were the different steps?

Site preparation, planting distance, planting technique, tools, pesticides, fertiliser

Where did you get the seedlings?

Who worked together at the project?

How long did it take?

What were the next steps after planting?

What was the frequency of checks?

Who worked on the checks? How many people?

What are other treatments?

How do you thin the stands?

How do you harvest?

How many?

Who harvests?

How do you transport the logs?

Where do you transport them?

What happens then?

What happens at the site where the tree was harvested?

How you monitor natural regeneration?

What do you do to protect the stands?

What is the production in terms of volume of each species?

How do you plan your inventories?

How do you do the inventories?

Who does the inventories?

#### Relationship of silviculture and site ecology

How does the planting site vary in natural features?

How do you adapt the plantings to this?

Where is each species growing best?

How do you think about species choice today?

#### Which of the practices are traditional, how, why

Which techniques did organisations from outside advise/ suggest?

Which techniques did you use before?

Which techniques did you keep?

Why did you keep it?

Please explain the technique?

In what context/ activity did you use it before?

Who else uses this technique?

What is the advantage of the technique?

Which techniques were replaced by the suggestions from outside?

Why did you replace them?

Who verified/ verifies which technique you use?

What do you think about traditional techniques?

#### What are the links between scientific and traditional knowledge

What did you do different before the suggestions of the outside organisations?

What are the advantages of these techniques?

What are the disadvantages of these techniques?

How much/ what do the outside organisations understand about the traditional practices?

What do they know about the advantages or disadvantages? About which do they know more?

What are the advantages of the outside practices?

What are the disadvantages of the outside practices?

How could you combine the traditional and the outside practices?

What do they have in common?

How did you decide what practice to use?

Who participated in the decision making?

What knowledge is needed to improve plantation success?

#### **4. Characterise drivers of reforestation and their motivations at different levels**

##### What are the actors, level of involvement and responsibility

XXX

Characterisation of the activities of each actor, objectives vs progress, What contribution each, why, why there, duration, species, area

What are you doing?

What are your daily activities?

What activity takes up the most time?

What are the main objectives of the institution/  
your goals?

What are your goals concerning planting of  
trees?

What is your contribution to the planting of  
trees?

How long have you been involved in what  
project?

What species was planted there?

What are was planted there?

What is your motivation?

What is the progress in the specific cases you  
worked on?

How would you describe the progress in relation  
to your goals?

Why did you get involved in this specific way?

Why did you get involved in that specific place?

Who else is involved?

What are they doing?

Why are they involving in that way?

## **5. Characterisation of the current institutional framework implementing reforestation/ restoration on national, sub- national and local level**

### Which institutions are charged with implementation of reforestation

Who is mentioned as executive entity?

By whom?

What is the legal foundation of the contract/  
agreement?

What is the civil/ de facto foundation of the  
agreement/ activity?

Who is doing what?

Where is each one working?

What is the level of functionality, swot analysis

?

s.u.

What institution is referring to reforestation in  
its program?

What is the context?

What is the strategy?

What are the objectives?

Who is responsible?

What are the control mechanisms?

What is the budget?

What are responsibility overlaps or gaps in the  
different fields?

What institution is referring to rehabilitation in  
its program?

What is the context?

What is the strategy?

What are the objectives?

Who is responsible?

What are the control mechanisms?

What is the budget?

What are responsibility overlaps or gaps in the  
different fields?

What institution is referring to restoration in its program?

What is the context?

What is the strategy?

What are the objectives?

Who is responsible?

What are the control mechanisms?

What is the budget?

What are responsibility overlaps or gaps in the different fields?

Is there a reforestation politic in the country?  
What is the political orientation? Relation with other areas of forest sector, what are intentions for forest legislation, what is the role is reforestation playing in the revision of the current forest law

What is the importance of reforestation compared to other goals (XXX, agricultural development, state budget, faun, etc) (e.g. in terms of budget, staff employed, XXX)?

What is the long term strategy?

(What is the position of international partners?)

What are the relationships with policies from other sectors?

What direction is the forest legislation dictating?

What areas of forestry/ types of forest/ ownership forms are emphasized or advantaged?

What is the role of reforestation in the revision of the forest law?

## **6. Characterisation of the role of the state, NGOs and other organisations in controlling efficiency of utilized practices including dissemination of practices**

What activities do the central services of MINFOR, MINEP and ANAFOR employ in ensuring efficiency of the implemented practices, what are strengths and weaknesses

+ How often do you do all these control activities? :

What are mechanisms to control the progress of plantation/ protection/ education activities?

What are mechanisms to control the costs of these activities?

What are activities to control the technical execution of these activities?

What are activities to monitor the involvement of different actors?

How is the success rate assessed?

How do you compare the success of different methods?

What objective do you prioritize?

How do you assess the tradeoff between the objectives?

What are activities to adjust the objectives?

Why does your control mechanism work this way?

What are the advantages?

What are the weaknesses?

Where do you see need for improvement?

How important is it for this institution to assess the effectiveness?

What do you think about the motivation of the employees?

Compared to before XXX?

How do you assess the risk of corruption?



How would you characterize the cooperation with the decentralized institutions?

What do you think about the cooperation with your other partners?

What activities do the decentralised services of MINFOR, MINEP and ANAFOR employ in ensuring efficiency of the implemented practices, what are strengths and weaknesses

s.o.

Do the NGOs participate in the evaluation of efficiency of silvicultural practices, which ones do, how, what are strengths and weaknesses

What do you (NGO) know about silviculture?

s.o.

## **7. Describe the current role of local communities, the private sector (industry), research organisations, governments, and their possible interactions**

Role of communes in plantation development

What are your daily activities?

What do you think about plantations?

What exactly are the advantages?

What are the problems?

How have they developed?

What are your actions related to plantations?

How has this changed?

Who else is involved in the activities?

What role do you play compared to other actors?

What are your responsibilities?

Towards whom are you accountable?

How much do you spend on activities related to plantations?

How do you take decisions?

What are your objectives?

In what direction are planting activities developing?

Why?

How is the cooperation with other actors?

What could be improved?

Where do you see competition?

Where is the need for more engagement?

How could other actors help you?

What is the role of the private sector in plantation development

What are your daily activities?

What do you think about plantations?

What exactly are the advantages?

What are the problems?

How have they developed?

What are your actions related to plantations?

How has this changed?

Who else is involved in the activities?

What role do you play compared to other actors?

What are your responsibilities?

Towards whom are you accountable?

How much do you spend on activities related to plantations?

How do you take decisions?

What are your objectives?

In what direction are planting activities developing?

Why?

How is the cooperation with other actors?

What could be improved?

Where do you see competition?

Where is the need for more engagement?

How could other actors help you?

What is the role of research organisations in plantation development

What are your daily activities?

What do you think about plantations?

What exactly are the advantages?

What are the problems?

How have they developed?

What are your actions related to plantations?

How has this changed?

Who else is involved in the activities?

What role do you play compared to other actors?

What are your responsibilities?

Towards whom are you accountable?

How much do you spend on activities related to plantations?

How do you take decisions?

What are your objectives?

In what direction are planting activities developing?

Why?

How is the cooperation with other actors?

What could be improved?

Where do you see competition?

Where is the need for more engagement?

How could other actors help you?

What is the role of government services in plantation development

What are your daily activities?

What do you think about plantations?

What exactly are the advantages?

What are the problems?

How have they developed?

What are your actions related to plantations?

How has this changed?

Who else is involved in the activities?

What role do you play compared to other actors?

What are your responsibilities?

Towards whom are you accountable?

How much do you spend on activities related to plantations?

How do you take decisions?

What are your objectives?

In what direction are planting activities developing?

Why?

How is the cooperation with other actors?

What could be improved?

Where do you see competition?

Where is the need for more engagement?

How could other actors help you?

What are the possible synergies between these actor groups

**8. Characterise juristic, administrative, institutional, political and technical aspects that have the potential to impair or promote the conception, implementation and follow up of plantation activities**

What are promoting/ encouraging aspects, how do they manifest

Are they juristic, administrative, institutional, political or technical

What are impairing aspects, how do they manifest

Are they juristic, administrative, institutional, political or technical

**9. Differentiate as far as possible the distinction between reforestation, rehabilitation and restoration from the point of view of the different actors in order to determine whether the issue of definitions plays a role in the conception and implementation of activities on the ground**

In practice or in the field, is there a distinction between reforestation, rehabilitation and restoration

What does reforestation mean to you?

What does rehabilitation mean to you?

What does restoration mean to you?

What are the differences?

What is the most important?

How is this reflected in your objectives?

What are the tradeoffs between the activities?

Who benefits the most from what activity?

Who suffers the most from which activity?

In the field: Where did you do what?

How did you choose the areas for the specific activity?

Why did you choose like this?

## Annex 2: Household Questionnaire

Hello my name is \_\_\_\_\_, I am a student and I do a study of trees and agriculture in the NW region. I work for a research organization that is doing only research and the goal of the study is to understand what people in the village do, how they do it and why they do what they do.

Your participation is important for the study, because only if we know the situation of a family, we can understand their choices, for example what techniques they use, or what crops they grow.

Your household was selected through a lottery in which each household had the same chance to be selected. We do this lottery because we do not have enough time to interview all the households of this village. One interview will take about one hour.

Can we go ahead?

If you don't have time and we have to stop we can also finish later.

I would like to ask you some questions about the activities of everybody that belongs to this household. When I ask a question, I always mean the whole household. Everything you tell me will be absolutely confidential. It will not be told to the government or your neighbors, or anyone else, but only used to understand the decisions you make. Your name will not appear anywhere, I only record it, so I can come back if I have more questions. Maybe you will find some questions very personal, but I ask everybody the same questions and they are important for the study. It is a great help to me if you answer truthfully. There are no right or wrong answers, because you have your reasons to do what you do. If you don't understand a question, I did not ask it well. Please ask me to clarify what I want to know. If you don't know, the answer to a question just say so, if you remember later you can tell me. We can always jump back to questions and you can always interrupt me.

Do you have any questions before we start?

Name

Date

Village

How many persons belong to this HH?

Relationship with Head of HH	
Age	
Highest education	
Profession/ Occupation	
Presence (M/year)	
Individual land (Y/N)	

How far are you from the village center? *What is the village center?*

5 min	10 min	15min	30min	1h
-------	--------	-------	-------	----

Have you had any organized training on tree planting or agriculture? On what exactly?

Who were you in contact with for this training?

Do you have any trees?

How are the trees planted;

in line	between crops	or in blocks?	other
A	B	C	D

For each practice:

Why did you plant them like this?

What species?

What is the planting distance?

How did you prepare the soil?

How did you care for the planting afterwards?

What did you do to protect the planting?

How do you harvest?

How often do cut or take out trees?

Why do you take them out? *(for each time)*

Do you replant after cutting a tree? How?

Where do you get the seedlings?

Why did you plant the trees? *For each type of planting. Possibly follow up question*

Are you nursing plants yourself? *If yes how do you do it?*

Why do other people plant trees?

How do other people plant trees? In which structure? Why?

Why do other people not plant trees? *For each type of planting, Possibly follow up question*

What is the advantage of having trees compared to having only agriculture?

What is the disadvantage of having trees compared to having only agriculture?

What do you need to have before you can plant trees?

What are the difficulties in planting trees?

How much of your land is common family ownership and how much individually owned?

How much land do you plant?

How much of this is common family ownership and how much individually owned?

Is there more or less commonly owned land than 10 years ago? *Why?-> Why?*

Are you using someone else's land for anything? For What? Why?

Is someone else using your land for anything?

For What? Why?

Distance		Quality
Less than 30 min	1	Very bad
30 min- 1 h	2	Quite bad
1h-2h	3	Average
>2h	4	Good
>3h	5	Very good

Ownership		Terms of access
Outside HH	1	Not specified
Common family	2	Yearly contract
Individual	3	Running agreement outside HH
Formally titled	4	Running agreement inside HH
Not occupied	5	Private property
State/ council	6	
	7	

Please tell me about all the land you use;

Use/ Crop or tree species

Area (football fields)	
Distance to home	
Quality (fertile, water)	
Terrain (steep/ flat)	
Ownership	
Terms and conditions of access	
Who works there? Any help or supervision?	
Who decides what is planted	

Why did you plant your trees where you planted them?

What things do you produce for your own household? How much?

Product	
Qty (per year)	

What do you buy to grow, seed and harvest or protect your crops?

Product	
Input	
Qty	
Price	

1	Corn
2	Beans
3	Potato
4	Cassava
5	Groundnut
6	Tomato
7	Pasture/ Cattle
8	Fuelwood
9	Sawnwood
10	Electric poles
11	Poles
12	Processed
13	Wage labour
	Other

What do you use each crop or tree species for?

Importance: Life without producing this would be (5 point)

Impossible	1
very bad	2
a little worse	3
the same	4
better	5

No	
Crop/ tree species	
Product	
Importance:	
Autosufficient (M/Year)	
Production (volume, number, kg)	

Sale to	
Price	
Production time/ Harvest age	
Reason for planting	

Do you want to plant more crops?

Why?/ Why not?

Why don't you do it?

Do you want to plant more trees?

Why?/ Why not?

Why don't you do it?

Do you employ someone to work on your fields?

How do you pay them? *How much?*

How many people offer to work your land? Do they work to get money or to get food?

What do you sell?

Product	
Qty	
Price ( <i>Unit</i> )	
To whom	
Where	

Do you rent out houses, tools or other things? How much of each?

What do people give in return? *Also non financial*

Do you get any pensions?

Do you get any subsidies?

1	Corn
2	Beans
3	Potato
4	Cassava
5	Groundnut
6	Tomato
7	Pasture/ Cattle
8	Fuelwood
9	Sawnwood
10	Electric poles
11	Poles
12	Processed
13	Wage labour
	Other (specify)

<input type="checkbox"/>	Impossible
<input type="checkbox"/>	very bad
<input type="checkbox"/>	a little worse
<input type="checkbox"/>	the same



Does anyone send you money from somewhere else?

☐ better

How important is this money for you? Life without it would be

Do you send money to someone else?

Can you borrow money from somebody? *How much?*

How sure are you that you can continue using certain land?

Ownership form

Afraid to lose soon	
Afraid to lose	
Little danger	
Some danger	
Land is safe	
Land is very safe	

1	Corn
2	Beans
3	Potato
4	Cassava
5	Groundnut
6	Tomato
7	Pasture/ Cattle
8	Fuelwood
9	Sawnwood
10	Electric poles
11	Poles
12	Processed
13	Wage labour
	Other (specify)

How sure do you feel that you will be able to sell certain products in the future?

Product	1	2	3	4	5	6	7	8	9	10	11	12	13	
Not sure at all														
A little unsure														
Confident														
Very sure														

How do you think the demand for certain products will be in the future?

Product	1	2	3	4	5	6	7	8	9	10	11	12	13	
Much less														
A little less														
The same														
A little more														
Much more														

How do you think the prices for agricultural and forestry products will develop in the future?

What product would you like to produce so you don't have to buy it anymore? Why don't you produce it now?

How do you see your wishes and needs reflected in the actions of the government services?

How will this change in the future?

Not at all	A little	Ok	Good	Don't know

How are trees important for your household?

Not at all	A little	As much as necessary	Good	Don't know

When would they be even more important?

Have you sold any land in the last 10 years? When? Why?

What is the land price for cropland, pasture and forest?

How has the land price changed? Why?

For how much would you be willing to sell the different types of land (without the crops on them)?

Which land would you sell first? Why?

Which land do people want to buy? Why?

How much land do most people have (in football fields)?

< 0.5 ha	0.5-1	1-2	2-4	4-6	>6

What religion are you?

In terms of richness, do you consider your household

A lot below average	Below average	Average	Above average	A lot above average

Do you have any questions?

# Annex 3: Transcripts of Semi Structured Interviews

## Contents

Interview 1: 01.07 NGO.....	80
Interview 2: 05.07 NGO.....	83
Interview 3: 09.07 CSO.....	85
Interview 4: 27.06 NGO.....	86
Interview 5: 12.07 Forestry official .....	90
Interview 6: 04.06 Forestry official .....	93
Interview 7: 28.06 Forestry official .....	101
Interview 8: 27.06 MINEP official .....	105
Interview 9: 01.07 Forestry employee.....	110
Interview 10: 12.07 MINADER Official .....	110
Interview 11: 03.07 Forestry employee .....	111
Interview 12: 08.07 Forestry employee .....	114
Interview 13: 08.07 Council official .....	114
Interview 14: 05.07 Council employee .....	117
Interview 15: 03.07 Council employee .....	118
Interview 16: 10.07 Middleman .....	119
Interview 17: 13.07 Middleman .....	122
Interview 18: 04.07 Private planter .....	126
Interview 19: 05.07 Private planter .....	129
Interview 20: 06.07 Private planter .....	131
Interview 21: 06.07 Private planter .....	131
Interview 22: 07.07 Private planter .....	134

## CSOs

### Interview 1: 01.07 NGO

founded 1996 to help women and youth group by improving farming their farming techniques, as they are the ones directly involved in food production. Goal was also to reduce pollution from burning fields and to secure the water supply. Since 1998 focus on agroforestry

Created a community forest at Ntangeture in 2010 of 6-7 ha. Species mahogany, khalendra, prunus Africana, E., Mango. Mostly administered by women and youth. total plot size 10ha, currently no means to increase the plantation size.

Land was donated by one of the members.

Legality issues were discussed with anafor who have a strong position and power.

Anafor did capacity building grafting, planting, marketing

They themselves created a nursery for the planned plantation.

Goals of the community forest plantation: 1: Climate change mitigation 2: Income for users, especially women -> AF e.g. Mango, Mahogany and Cassava. Income is more important, but the two are interlinked.

Species were chosen based on topography. Hills Mahogany, E., Everywhere Khalendra, Mangos, this knowledge was based on seminars they visited.

Production objectives: Fruits, Avocados, Prunus Africana, Nim (malaria)

Mangos are already being produced but they are stolen.

E. and Mahogany are not growing well, Khalendra and Prunus Africana are growing well

E. and Mahogany seeds were from anafor, fruit seedlings from somewhere else

Nkwen Multipurpose applied to anafor and anafor came to make capacity building and plantation planning. They rely on anafor for expertise in case of problems

NGOs that do not work with anafor have either not heard about them or do not trust them.

People would expect more support, especially financially if they apply at anafor.

Disadvantage of working with anafor are bureaucracy, no financial support, the financial/ economic concept of the plantation is not autosufficient.

They appreciate anafor's capacity building.

The project also benefits the communities around (e.g. mangos)

Plantations will only be profitable in the long run and only in the long run there are employment opportunities and sustainability will be secured

They cooperate with icraf

Activities: seminars to encourage women participations in AF as they are involved in food production anyway e.g. NW women forum. They plant trees also with other associations to promote AF. Promotion of *Prunus Africana* and *Khalandra* (for water, medicinal)

Medicinal plants are cost effective

Some (e.g. the president) are even investing personal income into the project, decreasing family income and therefore decreasing security

Income in the long run will mainly be generated through the sale of Mahogany (600 trees)

Planting distances are 2x2 or 4x4. *Prunus Africana* is 2x2

For more plants per area (e.g. 1x2 or 1x1) there would be more plants and funds and fertility needed.

Control 6 month after planting.

There are silvicultural treatments like thinning and debranching

Seedling are sold to community members and tree promotion network, individuals and the hospital.

Seeds for the nurseries come from anafor and oilpalm from the SW.

Nursery was established to be independent from others and for economic reasons

65% of the practices were traditional. Seminars are just a buildup of that knowledge. Techniques were not modified a lot but precised where to use which practise. Modern methods are asexual propagation and grafting. Traditional techniques in planting include leaf litter instead of manure.

Grafted trees have less fruit and a shorter life. Traditionally grown trees are more fruitful. These are observations from other planters. This is even the case if the plant material is from anafor.

Tillage methods will not change due to economic reasons.

Anafor knows species, but there is no current contact or supervision.

Anafor cooperation started last year with the *Prunus Africana* and the Mahogany, project duration is 5 years.

ICRAF has a better understanding of traditional methods than anafor. Their philosophy includes traditional practices as a foundation for sustainability, whereas anafor is rather industrial.

Knowledge about project management, report writing, business plan and acquisition of funds is needed.

Proposal on management is made by the farmers and validated by the president.

Budget is not clear cut, need for project management and budgeting. Sometimes expenses are between 500 000 and 1 000 000 XAF

Each year project success and problems are discussed. Main indicator for success: cash

Other cooperations: Corni sud, other small groups, SIDEP from Nwen village, Agro East Africa

Networking of NGOs often happens at seminars

Policies of the govt are sometimes conflicting. People are not checked for competences if they want to start a community forest initiative. On the other hand there are no funds for competent groups.

There are NGOs and NGIs that have “paper forests” and reap state funding and benefits. This is known or detectable by other NGOs. Some accept it -> corruption. The lack of time for project inspection by govt or funding organisations is taken advantage of. Many NGOs with “paper forests” used to have forest or projects, now rather look at it as a profitable activity.

Hierarchical structures in which funds “trickle down” do not work, a bottom up approach is needed. Fund allocation in bottom up approach: Check: 1: competences in the field 2: Land availability 3: Experience 4: Inclusion of minority groups. Farm visits and evaluation is important.

Work on the ground is needed. Re- and Afforestation should happen through small organisations or individuals, not big ones. The small organisations are highly motivated to plant, understanding the importance of plantations and livelihoods, but they lack funding.

Nkwen Multipurpose wrote a project proposal on maize in 2006 applying for govt funding. Funding was approved but funds were given to someone else outside the NGO. They feel like toothless bulldogs, able to communicate problems but with no power to enforce objectives or change things.

The overall rate of planting in the region has not changed. The number of private persons planting may have increased, but each one is just planting 1-6 trees (e.g. with childbirth). The burning of bushes has decreased, fostering natural regrowth. It decreased because of more environmental awareness and in order to reduce pollution and thus health risk. Even charcoal making from grass for fertility increase (“Angara”) has decreased. Fertility increase is also quite short, ca. 2 years.

Forest had always been an integral part of the NW region culture, e.g. the palace forest in the heart of a village

The importance of reforestation for the government is 1: fight desertification 2: retain water and biodiversity 3: fight climate change: change of seasonality, longer dry season. BUT talk is not translated into action. There are also no advances of decentralisation (although there is a whole ministry).

There is landslide risk

For direct action, trees should just be given to planters, as seedling costs are too high.

Nkwen multipurpose is part of Nest Cam, but nest cam is not effective, because there are too many groups with different interest. The groups put their own objectives before the common goals. Nest cam is not sufficiently structured and needs more capacity. Nest cam cannot facilitate projects or establish cooperation that make projects possible. Groups also have different competences, so they should be grouped.

Without own nursery, they would buy seedlings either at anafor or at the market. More expensive or unusual crops are bought, if there is a market demand, otherwise the least expensive are bought.

They have no clear idea on the distinction between the 3 R, they do afforestation.

They were disappointed they were not invited to the big CIFOR seminar in Yaoundé.

## Interview 2: 05.07 NGO

Mostly farmers organisation working with 100 farmers groups of 30 members each. One partner in the Netherlands is CTA. They supplied them with a large library and did a lot of capacity building.

Their focus is on climate change and its impacts on agriculture and the importance of trees in this regard. Most farmers groups are now identifying means to combat climate change and to preserve forest.

They are working with groups on community forest. This requires sensitisation on the benefits of the forest and its preservation, as they have high demands on the forest for fuel, fuel and construction material. Therefore they are advised to plant economic trees that can serve these purposes.

At a national assembly there was a meeting on REDD+ where they learned about how other people preserve the forest using carbon funds.

Despite the need for forest protection the population's demands for forest products must be satisfied. The change of provision patterns must be promoted by small local groups by motivating and sensitising.

Natural forest is declining very fast due to agricultural expansion, which is fuelled by population growth. Also natural forest was not able to generate economic benefit for locals.

CTA gave advice on how to increase sustainable revenues from forest, but the effort did not function here. Forest management proficiency is very low here. Most of the forest left is made up of kola nut and palm trees, which is lacking the ecosystem function of a natural forest. They advise people to plant either oil palm, kola nut or avocado for reforestation.

There are no seeds for forest trees that would be needed for forest regeneration. They would like to distribute them if they could obtain them. They do not have a means of transport. They would like to plant species like Moringa, Nimes, palms, kola, avocado and mango.

The rate of deforestation is high. To counteract this tree planting should be done organised in the framework of community forest. Planting efforts should be controlled closely on a monthly basis by local organisations, to make sure that trees and funds are used correctly. The small organisations can then report back to the big funding organisations. The only organisations that were engaged here except AF, but their projects failed because from their distant offices they were not able to do the close follow up that local organisations could do. Also there was not enough capacity building or imposing species on farmers that did not have a direct use for them.

The focus of the organisation is reforestation around and in the community forest as well as alley cropping on agricultural land. However, many farmers are farming on land they do not own and the owner do not permit the planting of trees there. This does not apply to economic trees like oil palm and mango

Economic importance is the best guarantee for tree preservation.

Community forest will be created on land from the fon. The initial objective of the community forest is strongly related to environmental protection and ecosystem services.

People are also being convinced about the benefits from carbon credits, although it is not yet operational. The Minep has a project REDD readiness, but people here cannot benefit. This would require the proposal of a project. In reality the chances to actually participate are very low as bureaucracy and costs are prohibitive, so that people usually abstain from it.



Most community forest is next to palace forest, which should be the starting point for reforestation activities, as it also reflects the cultural heritage. The fon's land will donate 50 to 100 ha of his land in case funds for a carbon project are allocated. Currently land that is to be planted is currently used for agriculture by private farmers. These farmers can abstain from agriculture there as they can compensate the agricultural activities with income from oil palm if they have land to plant it. Oil palm will only be planted on private land. Income from the community forest from e.g. Kola will be distributed to the community. The economic importance of the kola trees in the forest will motivate the community to protect it against encroachment and nurse the trees.

Kola nuts are felled at a high rate as there are many of them and there is no market. This could change if there was a way to process the raw product, which also applies to mangos.

People will start planting if they are confident that there will be a market for the products and that the trees will bear fruits. In contrast they will cut down any tree that does not provide income.

The problem is the lack of seeds for the different trees. With the seeds they will create a very large nursery and distribute to the groups.

They encourage to plant more trees than needed for autoconsumption in order to create a surplus for sale.

He wrote a project proposal for REDD+ combining 10 community forests, identifying at least 3 ha for reforestation in each one and restoring the forests, at the same time educating the communities and protecting the existing forest. Additional 10 000 trees are to be planted around the existing forest. The management committees will be trained. Improved stoves will be introduced. Short term income generating activities like cabbage production is to replace the sale of wood from community forest. People are currently not engaged in these activities as they lack advanced horticultural equipment, and input material. They will be motivated to conserve the forest through the carbon credits.

Other cooperation includes the EU, UNDP, MINEP and the 100 small CIGs (farmers groups) from Momo.

Farmers are organised in groups, because it is the requirement for govt subsidies.

Constance, the lady that joins us is working on the supervision of world environment programs projects, sponsored by the EU, making sure they meet the criteria for approval and further funding. She is also advising farmers on what they could improve. Many projects are on crops that can be processed like cocoa and oil palm which are promoted now in order to attain levels of production in the future that make the local processing profitable.

The projects are in Momo, Ndonga Mantung and Menchum and mainly focussed on ensuring the sustainability of their projects and promote agricultural innovation. AF is one component of it, especially for fertilising the soil and substituting chemical fertilisers that are unaffordable for most farmers. Other components include infrastructure, forest protection and catchment planting.

A problem is a lack of seedlings and seeds not so much their cost. Local seed multiplication and propagation would be an interesting project. This would require knowledgeable organisations, e.g. ICRAF to contact grassroots organisations for capacity building, problem identification, nursery creation and knowledge dissemination. Nurseries could even become a profitable activity. Starting these initiatives requires funds, especially for mobility to ensure a frequent and close contact.

Big organisations that lack connections on the ground often fail in implementing projects.

He is happy to help with research and show me around...

Working with two peace corps: Sheila (computer) and Kate (environment)

### Interview 3: 09.07 CSO

Objective of Beruda is raising the standard of living of rural population via education on sustainable management of land and increase of income. Working areas are agriculture, medicinal plants, tourism, tree grower training, environmental awareness, widow groups, health

Products from trees are fruits, e.g. Avocado, timber, medicine, e.g. Pygeum. They also produce clean air, shade and beauty. They are also to provide some income for the farmers.

Transport of the trees is responsibility of the farmers, but if possible they get assistance, especially if they buy more. Farmers make contact and choose plants.

Prices depend on farmers level of income and on numbers purchased in order to stimulate seedling demand. They try not to lose money and they are quite close, calculating material and time cost per species and plant. Even though people generally do not largely invest in trees they still want to offer them to prevent unavailability of seeds being a constraint for planting. They are still developing the catalogue of species they offer.

Prices:

Papaya 200

E: 50

Avocado: 350-500, grafted: 1 000

Bottlebrush: 150-200

Raphia: 300

Other species: Plum, Lemon, Leguminous species, Mango, Canarium for timber

Customers that buy the most seedlings are associations and NGOs.

Generally people do not know about the advantages of grafting, but those who do like grafted seedlings, but lack money to purchase them. Grafting reduced time to harvest, reduces height, gives people certainty about genetic quality and even enables people to have two species in one tree increasing product diversity on limited space.

People that buy are instructed at the nursery, but do not get follow up, however they are very motivated to make the most of their trees as they made an investment.

He either collects the seeds for the nursery or asks children to bring them. He chooses after germination criteria rather than quality of parent tree, except maturity and restricts to species that have a practical use for farmers. Seed collection is best in Oct-Dec.

Cooperation with other groups in the area are still developing. Baruba can network farmers and supply information of who is farming what and where and who can supply which seedling.

Govt has agreed to support private nurseries financially (info from Minfof delegate)

Minfof stopped its nurseries in order to prevent competition of their free seedlings to private nurseries. Now they support Beruba with seedlings.

Councils have an environmental committee and should use it to promote nursery creation, but getting permission from higher places in the hierarchy is an obstacle.

The local population confirms environmental changes, especial reduced water availability

Economic incentive alone is no sufficient incentive for tree planting, because even though people plant, they do not as if involved in a business project even though they may be convinced of profitability. Economic and environmental interest go hand in hand.

There is a private nursery in Ngua, 8 km towards Laikom, there may also be some in Njinikom, but he may find more.

Private nurseries seek advice at association nurseries.

He is asking if there is any mechanism to make sure people replant after harvesting.

He is in contact with a peace corps volunteer.

#### **Interview 4: 27.06 NGO**

Nest cam is a cooperation of different NGOs.

Goal: coordinating the work of all NGOs intervening in the environmental sector to harmonise effort in a common vision.

Activities: Information dissemination, a lot of lobbying on behalf of member organisations for policy change and especially funds or physical equipment and even plants for planting, lobbying to international organisations for funding and capacity building, capacity building, especially of NGO leaders, which are in turn encouraged to pass on this knowledge to the grassroots organisations and linking to other organisations. Nest cam strictly avoids involving into the specific activities of the members

Policy lobbying especially in the environmental sector. In case of REDD they lobby for inclusion, so that they became one of the coordinating organisations in the NW region for the national REDD and CC platform.

Lobbying also with local authorities, as these sometimes suppress local NGOs. Advocating their rights in case of arguments.

They are setting up a regional observatory on land grabbing for grazing and plantations in order for people to be able to denounce local elites and publicize their marginalisation.

They use the network to pressure central and local government, as well as private persons and practices may also involve the organisation of civil disobedience

The network includes 27 organisations.

The Cameroon development cooperation (CDC) is setting up tree plantations in Ndonga Matung division (Tem area).

He is from Nkambe

Typically on the NW there are different plantations: Tea and Oil palm. Tea under CDC (Ndu). It was privatised and the local elites took over. The other one is very large.

Ndonga mantung Mamfe there are also Oil palm plantations. There is much interest because of the new route to Nigeria and the upcoming export opportunities.

Permissions for government land/ concessions are granted from Yaounde before any impact assessment, often displacing farmers.

The (group email) debate involves prior consultation of local communities, their benefits and payments, tax payments of the company, frequency of payments and place of tax payment, environmental impact assessment, alternative: smallholder schemes

However, large projects also have positive effects like infrastructure improvements.

It would be important to educate local people and not import specialists and use locals as labourers.

Apart from that there are maize plantations, and rice plantations which are encouraged at present

Ndonga mantung is also the place of E. plantations.

NGOs oppose E. and the current message is to plant E. on marginal land. E. has a strong traditional role in the local economy for poles, scaffolding, roofing of houses and electric poles. Other species do not grow as fast. There are a few attempts of other timber species, but these are not very widespread. They exhibit slow growth and are unlikely to be able to supply the products, especially electric poles, and roofing, so people are very reluctant to move away from E.. There is currently no alternative to E.

There is Pygeum, but not very widespread.

In Ndonga Mantung the landscape is dominated by E.

Community forest is natural forest (or patches) that was demarcated and is to be conserved. These community forests exist in different qualities. It is to grow naturally for the benefit of the community.

There are councils that have community forests, made up of E.

Council can use council land in any way they want. It has been allocated to the council for development purposes.

In Kumbo, a large council E. plantation in the city center, was cut down to make space for agriculture, urban development and to increase security

Council land may be used by privates if it is idle, however knowing that he may be evicted in case the council claims it. If a person wants to use the land he usually asks the authorities, i.e. the mayor, even without compensation. It is a matter of understanding and not very well arranged. Sometimes it just goes to relatives or persons close to council members. There is no law or regulation on the allocation of this land.

The planting of E. is not very demanding in knowledge. Plantings are not organised. No knowledge of the E. species. People even plant during the dry season. People collect seeds sew them and sew the survivors the new rainy season. If protected from animals and kids it grows without problems. People don't see a need for a more scientific or technical approach.

NGOs rather advise to plant the E. on marginal land and promote other species, including the nursing and distribution of these species. They do a follow up only on these species.

Anafor has very limited capacity. They only have 3 or 4 staff at the regional service, which is to cover the NW, W and Adamaoua regions. They have a small demonstration of a nursery there where you can get seedlings at reduced prices, but they don't even teach you how to plant. They take part in big events like world desertification day, but they don't go to see the small farmers or groups.

Nestcam is telling ANAFOR that they are wasting their time as they cannot follow up on the planting efforts. Most of the planters that come to ANAFOR are NGOs. So ANAFOR ought to do is to organise workshops and seminars to show the NGOs what to do in the field and what to teach other farmer groups, but ANAFOR had not organised these services. Anafor seems not to know what they want.

Drivers of E. plantations were initially primarily occupation of land where much was unused and demarcation of land where there was competition. Later on economic concerns developed with increasing need for construction and especially fuelwood. Now there is an enormous demand from the production of electric poles.

On the road from Bamenda to Nkambe there are more than 10 to 20 trucks each day bringing E. from Buy and Ndonga Mantung. All sawmills for E. are in Buy and Ndonga Mantung. There is even a strong impact on the road.

So the main incentive for the planting of E. is the strong, consistent and foreseeable demand.

There are other species mostly promoted by NGOs, e.g. fruits, but farmers do not see the need for these trees, although some deviate from a pure E. mentality as they witness the negative environmental effects of it. NGOs encourage farmers to do AF, still farmers show no real incentive to plant the native species as they have not seen any benefits of the native species. They cannot be convinced because they may not see the benefit of the trees, either because of the long rotation age or because of the abstract nature of the effects, like carbon sequestration and climate regulation.

Some farmers have planted these species, facing lots of difficulties, as it is not really going as envisioned. A culture and intimacy of the farmers with these species is still to be established.

Cameroon has a very good forest policy fixing forest cover and ratios of export and domestic transformation. However, the problem is its implementation. It makes no sense to keep modifying legislation if the current enforcement system is not even implement the current policies and laws. It is more important to concentrate efforts on implementation and learn from difficulties in implementation. Many control are not omitted and many people know about it. The main problem is that there is a lot of corruption involved across all level. Officially seized products (e.g. from illegal exploitation or arbitrarily seized) are later resold by the officials.

The NestCam is controlling their projects by quarterly, annual or also project based evaluations. NGOs do a lot of work which is not being acknowledged their role often ignored and cooperation not taken into consideration. Often it is them who are gradually changing the communities as they are in contact with

them on a day to day basis. In contrast the govt is coming around once or twice a year. NGOs are asked to present their projects at the quarterly meetings, including objectives and evaluation. Then experts within the network are suggested for respective problems. The network involves many people with different capacities. This is also a way of checking the NGOs for the utilisation of funds. In case of underschlagung NestCam will sanction them.

Some members of Nestcam are working in research organisations that joined the network as individuals. So they have no cooperation with any research organisations themselves.

Cooperation with the MINEP involves the supply of office space and equipment. They work with thme, but they also put a lot of pressure on them. MINEP also depends on them, as they can mobilise and gather key stakeholders for meetings and confernces, also those that are not part of NestCam. They are the networking instrument of the MINEP. However, other ministries do not make use of this expertise, e.g. the MINFOF. Nestcam does not collaborate with the MINFOF. It also depends on the person that is in office there, as some do not wish to collaborate or are not open to advice. Good collaboration cannot be forced. The MINEP cannot do anything without consulting NestCam.

NestCam approached the Minister of FOF and asked for a meeting to formalise and plan a better cooperation. the meeting was never called. Equally the NestCam made a proposal on possible collaboration, but there was no response or acknowledgement of reception.

Reason for lack of interest may be lack opportunity for personal gain of key officials or just laziness. A politically motivated inertia is unlikely as there is no competition from the NestCam to public institutions. NestCam is just helping them to do their work.

NGOs do not work for financial reasons, but for internal motivation. There are many NGOs in the NW, some of which have so little means, the members sacrifice a lot for the cause. Many stay behind their potential because they lack mobility.

Reforestation: Bring back forest that has been cleared that existed

Rehabilitate: Protect a highly degraded forest in order to let it regenerate naturally

Restoration: same as rehabilitation

In the NW the term and action of rehabilitation is more important. Here there are highly degraded community forests and its rehabilitation via conservation is important.

There is not much reforestation in the NW. People engage rather in AF. Also Afforestation is important.

Verena Ingra worked with CIFOR. NestCam is her Brainchild

Schumas office was closed by taxation

Rainy season: Start in March 15th and end in early October

This year earlier

Public Servants and Officials

### Interview 5: 12.07 Forestry official

The NW region has riches in forest that is generally not acknowledged. It is not a savannah, but a transitional zone. This includes the montaine forest Kilum Ijum. It is very rich in endemic species. On the foot hills, there are very rich equatorial tropical rainforests (South Menchum, Fuaouwa, Mbenbe and Boka forests). They are more accessible from Nigeria.

MINFOF is responsible for the sustainable management of these forests in cooperation with the local population. The local population works with the service through their councils, NGOs, CIGs, community based organisations, village forest management committees.

These forest reserves are either community forests, council forests, or managed by the state.

Tubah and Wum/ Fundong are councils managing forest reserves. This is problematic as natural forest ecosystem and wildlife management requires a very high level of skill, which these council may not have.

Bafut Ngemba has an important water catchment function. It might be possible to link Bafut Ngemba and Bali Ngemba, which has important patches of natural forest.

Forest is very important in the NW because the population pressure is very strong. The forest size is NOT increasing. Instead, through agricultural expansion and grazing there is a high pressure on remaining forests.

The Minfof's strategy to conserve forest resources is a participatory approach to forest management. Sensitive forest areas have been gazetted into forest reserves. Around the reserves community forests have been established. This land is state land for which the community has requested and been granted the management rights. They have the community forest management council in village structure. There are also village forest management committees that are in contact with the conservator of the protected area in order to negotiate the products and amounts they may extract from the reserve on the foundation of users rights.

The forest is not very well studied in terms of species and growth characteristics. People use the forests for NTFPs especially food and spices.

Protected areas need to have a management plan by law, however it is too costly for the ministry to invest into this. Due to the little recognition of the importance of forest in the NW, other donors (bilateral aid or big NGOs) have not shown interest in funding the creation of management plans.

Actually the forest should be a national priority because of the strong pressure and the sensitivity and endemism of the ecosystems. The value of these plants for medicinal etc purposes and the traditional knowledge connected to it may be very valuable.

The minfof created guidelines for participatory forest management on national level. These have to be adapted to the realities on the ground. Communities are consulted for their needs and the forest is assessed on production. The knowledge on tree characteristics of the population is taken into consideration. Equally they give account of the forest history. There is no inventory for community management, but only for industrial exploiters, who have to pay for it. Their concession volume is based on this.

Most timber exploitations in natural forest are illegal and heavily punished. Obtaining a cutting permit for natural forest is very burdensome and connected with environmental impact assessment. It takes much time and money, so many small and medium exploiters rather try to cut illegally than follow the regular process.

#### Types of forest

- Communal forests: state owned
- Community forest: state owned, management by communities and MINFOF
- Council forest: state owned, management by council
- Forest reserves: state owned, management by MINFOF
- Private forest plantations: privately owned, management by private

All natural forest is on government land, because government will not allocate land with natural forest to a private owner, as the natural timber resources are public property. Government permission is needed for clearing. Even on traditional use rights you are liable to harm that comes to the natural forest on the land.

For the exploitation of planted trees, the procedure involves informing the local forest authority (chief of post) and having him evaluate the tree. After harvesting he delivers the certificate of origin. He registers this to the divisional delegate for statistical purposes.

Statistical analysis concerning harvested tree volume is still in progress.

Differentiating between natural and planted forest is easy due to old growth species that show the duration that the forest has been undisturbed.

There is a formal procedure for the privatisation of communal forest area, but this practice is not encouraged, putting general interest before personal interest.

There are not enough workers, as they have to know the different types of forest in their area. Requests for more financial and human resources are filed in the context of the workplan, which includes a detailed description of activities and connected costs. This is a new system, to which employees are still getting used to and success has yet to be evaluated. The workplan proposal is controlled centrally for cost calculation. Later on, the implementation of the project is also inspected.

Coordination meeting involves a presentation of past activities, planned and intended activities on divisional level. The activities have been discussed on sub regional level before. The outcome of the regional coordination meeting is a report that will be sent to Yaounde.

The directorate of forestry can decide to send a team to control a forest project or the state of a forest. The shape of the control depends on the objective of the control mission, which is defined by the central ministry. The regional delegation do not know what they are controlling. The regional delegates are just trying to work towards their objectives as outlined in the workplan. There are heavy sanctions up to job loss, however there is no set catalogue of penalties, so people are afraid. Control activities (internal and external in case of inventories) are also the main task of the brigade.



Before, the govt makes the state budget and assigns fixed budgets.

Tree planting is being promoted via the national tree planting program launched in each region. It includes the allocation of protected areas to councils for forest management and water management. Some councils have created fuel plantations. Councils can apply for funds for plantation establishment and many have received them. See picture.

NGOs and CIGs are to register at the MINFOF if they have planted, so their efforts can be verified and communicated to the central ministry, which may allocate funding for further plantings at the next launch of the program. In case of non-compliance, funds may be cut or demanded back.

The participatory approach is to make the people feel that they own the forest, belong to it and are responsible for its management, which increases chances for sustainable management.

Technical advice to the local population is the main task of the posts.

Advice includes plantations and in case of agroforestry advice will be delivered as inter-ministerial collaboration with the agricultural officer. This is mostly initiated by the agricultural officer, inviting the forestry officer. The agricultural officer is also in charge of fruit trees and cocoa and coffee trees. Seldomly, they contact the forestry officer in case of fruit trees.

Anafors main role is to provide good quality planting material. They have to work with the MINFOF. They are a semi- autonomous agency with their own objectives. Their activities can be narrowed down to a strictly arboriculturalist approach of forestry. In contrast, the Minfof is involved in social forestry, urban forestry, private plantation forestry and conservation forestry. Anafor is strictly working on the establishment of tree plantations.

If any NGOs or CIGs become active in the field of forestry, they are asked to contact the local forestry post and obey the subsidiary hierarchy in demands (e.g. documentation of efforts) and concerns. Petitions for funding are channelled to yaounde via the regional delegations after they have been checked for quality and former results. Yaounde decides on a case to case basis which projects to fund. However, the evaluation of tree plantings involves the check of running measures like weeding and protection, but funds are only reallocated after a longer period of about 3-5 years, when success is certain and depending on the efficiency of the management.

Plantation management is dependent on species and objectives. For E. a planting distance of 3x3 to 5x5 m is advisable. When reaching the size of poles, one in three is cut. When they reach the dimension of electric poles, one in three is cut and the remaining can grow to the desired size for sawnwood.

Specialising on the provision of electric poles, the planting distance can be greater from the start, e.g. 10x10 m. However, this will increase maintenance, especially weeding.

Farmers are given options depending on how fast he needs money and if there is a market for the products. The forestry service is giving out all the information on the different options.

Obstacles to tree planting is the long term return of the investment. There is not enough land. Planting requires knowledge about species and suitable terrain as well as other consequences. Local species grow slowly, exotic species may be harmful to the environment.

The MINFOF should return to the former system with each level of the forest service has a tree nursery and quality seeds of tree species adapted to the practical demands of the area. Private nursery owners are

to use these nurseries to copy these techniques in their own businesses, under the supervision of the forestry technician. This will lead to the production of more and better seedlings with better survival rates. Plantations can be established faster as there will be enough planting material at the right age and replanting can be done timely.

Stakeholders need to come together at a common forum and share their ideas. This is expensive, which is why it is important to raise awareness about the importance of the forest in NW and make this issue interesting to funding organisations (bilateral aid organisations and big NGOs).

There is enough land to plant trees, but especially in the areas where trees have been cut in order to maintain the natural forest. Water catchment are a priority for planting as all the main rivers are coming from the mountains. The next priority are areas around, but not within, the natural forests, preferably with seeds from the natural forest. Third priority are protected areas or forest reserves. For private plantations the location will depend on the individual and its objectives.

The regional minfof has no incentives or does not promote activities on divisional or sub-divisional level. They are not authorised to do so nor do they have the means, so they are limited to technical assistance to tree planters.

Every divisional delegation has its priority areas depending on forest -pressure, -ecology, -management. This is part of the workplan, where objectives and actions are justified.

In this context, the respective, e.g. divisional delegates can give special recommendation for a project outlined in a workplan and ask for funding from Yaounde.

The brigade control do the assessment of wildlife, timber transformation activities and forest management and -state depending on the objective of their control mission. They act like general auditors within the forestry service. There is a brigade on regional level.

### **Interview 6: 04.06 Forestry official**

There are significant (?) plantation activities in four of the seven departments of the North West region (in order of planting magnitude):

- Bui
- Boyo
- Ndonga Matong
- Mezam

Fundong (in Boyo, 1, 5 h from Bamenda) has some very good examples of plantation activities with good silvicultural quality

Plantations are constituted mainly of *E. saligna* (which is used by AES for the production of electric poles), with some *E. robusta*. *Prunus Africana* is also frequent e.g. in hedges. A combination of *P. Africana* and *E.* is possible, whereas agroforestry with *E.* yields very poor results. However, there are attempts of Agroforestry including *E.* and other species.

There is a need for reforestation in the NW region, but there is also a shortage of land and competition with agriculture and mostly cattle ranching. The demand for wood is mainly driven by the demand for

electric posts. Still, there is a significant trade and transformation of eucalyptus wood for construction wood. Harvest residues (65% of tree) are being sold as fuelwood (500 F per bundle (dry)) or small poles. Harvesting the E. for the production of “2x6” (4m x 14cm x 5cm, 1 600 F per piece) requires a longer rotation (>10 years) but yields much higher financial returns. However, most farmers make the harvest time dependent upon their cash needs. Although there are associations of private landowners, there is a high pressure to accept the prices given by wood merchants, as the population’s dependence on cash income is high.

#### Actors

##### 1. Forest owners:

##### 1.1 Private owners (80% of surface in W, 95% in NW)

Private owners plant in lines among their borders, in larger patches, or as a combination of the two (broad stripes).

People wish to diversify their income. An exemplary organisation of land with different activities at the same time is: Cattle raising, E. plantings on the borders of the fields (from line to stripe breadth), also hedges of *Prunus Africana*, Agriculture .

Planting activities have increased in the NW . Initially, small scale planters (<1 ha) were not to be given seedlings by the ANAFOR (see below), as a follow up of the planation would be hard considering the ANAFOR’s limited resources and the high demand by farmers. However, the ANAFOR decided against this in order to foster reforestation, resulting in more plants sold, but uncertainty about the extent of plantation/ reforestation achieved.

Opposed to the perspective of high ranking forest officials, there is no increase of wood production in the area in the eyes of AES, at least he sees a decrease in harvestable wood. This is his conclusion from the ever increasing distances, raw material (pole wood) is traveling to his factory since the privatization of the electrification.

Before the privatisation people needed a harvest permission

Motivation of farmers for planting:

- Income: regional and interregional sale of many products
- Climate change/ watershed protection
- Planting to secure tenure

Areas planted by small actors and community forestry shows “bad” results, because there is

- No security over permanence (owners may cut if they like)
- Bad silvicultural quality
- No obligation to report or have control

Obstacles for the establishment of private nurseries:

- High costs discourage them
- They lack technical knowledge
- They lack time

## 1.2 State: State reserves -> reserve list (RL)

State reserves were created in order to secure a permanent forest cover of 20% (later 30%) in the region. Although large in extent, the reserves have been abandoned and are subject to encroachment and timber theft despite regular patrolling of the regional guard. Despite great potential and strong, but endangered timber resources, the state shows no willingness to manage the plantation, as it has been failing to create management plans (Inventory and Activity program), which are a requirement of forest utilization.

Although illegal occupations endanger the reserves, an eviction of illegal settlers is not feasible as it would create a social uprising. Therefore Mr. Nono proposed a participatory reforestation approach, in which occupied areas are replanted and can be used by settlers in a Taungya method. The settlers are to look after the trees as long as they can farm the land under them and then leave the land. This would give them time to adapt to the stricter enforcement.

Example: Bafut Ngemba Reserve (3 200 ha), created in 1953, has never been commercially used, with most stems suitable for the production of sawnwood and heights of up to 50m. The lack of a manager/conservator and management plan has led to a silvicultural production well below its potential, a lack of purposeful natural regeneration, frequent forest fires as well as timber theft, overuse and land occupation by people from the surrounding villages. The Bali Ngemba Reserve is in the same condition.

Forest areas planted by the state:

- Bafut Ngemba (E.) 3200 ha (30 min)
- Bambui (E.)
- Bali Ngemba (E.) (2 hours)
- Wum (natural reserve, established by the Communes Wum and Fundong)

## 1.3 Communes -> RL

The mairies profit from the aid of the state for the reforestation (e.g. Fundong). In 2010-2012 there were 100 000 000 FCFA for the support of communes in the NW

## 1.4 Communities -> RL

Areas planted by small actors and community forestry shows bad results, because there is

- No security of permanence (may cut if they like)
- Bad silvicultural quality
- No obligation to report or have control

## 1.5 Associations

There are associations of private owners in Nkambe, but still the pressure to accept a low price for trees/ timber is high as people depend on the cash income derived from this activity.

## 2. Government

### 2.1 MINFOF

The state doesn't want more primary actors in the reforestation, but to pass the responsibility to the communes and has done so after 2010

There are Geo references of plantations by different NGOs who do the reforestation, which is also encouraged/ fostered by the central MINFOF office in Yaoundé.

### 2.2 ANAFOR

The "Agence Nationale d'Appui au développement Forestier" (ANAFOR) is an institution created in 2006 to increase and monitor reforestation in Cameroon. It keeps records of private landowners that planted more than 1ha and purchased the seedlings at ANAFOR. Its goals are the promotion of reforestation/ plantation establishment in the private sector. Hereby it is seeking contact with all stakeholders and including on the ground work via extension officers that assist in site and species selection and follow up on planting events. The humid savannah ANAFOR office in Bamenda has an extensive nursery of potentially high quality material that is sold to interested individuals. These quality seedlings are multiple times as expensive as those sold by the roadside in many places.

Specific goals are to

- Promote new forestry economic sector based on plantations. Production of timber, poles, fuel, food, medicine, climatic conditions and other goods and services
- Make use of existing network of knowledge and skills at national and international level to create a database to serve different actors in plantation sector
- Make Cameroon a greener country and demonstrate commitment to sustainable management and environmental protection

The strategy lies in knowledge transfer to the farmers through extension officers in order to foster the spread of good silvicultural techniques and to develop forestry culture and qualitatively good products. They also create networks between communes, NGOs and private owners. NGOs are actively involved in planting activities. NGO cooperation include: Schumas, Minep, IUCN, PNDP, Sawamaco (sabga). There is also a cooperation with ICRAF.

Physically ANAFOR provides seeds/ seedlings, planting materials and tools to farmers.

ANAFOR offers ca. 50 species depending on the demand of the farmer. Predominant species are E., Pygeum, and Mahogani.

Dangers to plantations are

- fire,
- grazing,
- human pressure,
- Boundary conflicts.

In order to face these dangers, the technical staff is working in cooperation with the farmers, e.g. on apiculture etc.

Main problem of the ANAFOR is a lack of funding. Further resources would be used in order to:

- Subsidize quality planting material (otherwise high price will discourage farmers from planting and indirectly promote bad quality planting material)
- Increase number and means of extension officers

ANAFOR collects information on land area, ownership form, etc. for every person that bought plants, BUT it is sensitive and cannot be given out.

A concern of the ANAFOR relates to the evaluation of planting results. Before the privatization it was easy to assess the exact number of ha planted. (?) Now, ANAFOR is approaching the population and tree planting is private with little influence of the govt. The assessment of area planted is hard because of

- Species diversity (intercropping?)
- Number of individuals that plant less than 1 ha (only number of saplings sold, not area is known)

The ANAFOR sees the need for the Government to give incentives for planting, as this would boost plantation activities.

### 2.3 Regional Forest Office

The regional forestry officer works together with the ANAFOR in following up on the plantations, although reforestation activity/ help not part of the annual work plan of the forest office. (Nono)

The office (next door to the ANAFOR) also has a nursery, which produces 30 000 plants each year, which are completely consumed by the demand for seedlings. In contrast to the ANAFOR seedlings are often offered to a low price or given away.

“The ANAFOR also produces a lot” implies that the ANAFOR seedling production surpasses that of the regional forestry office.

## 2.4 Consortium for the “plan gestion des terres”

The “plan gestion des terres” fixes the authorized land use, e.g. for agricultural, industrial, or reserve use. It is created in a cooperation of Forestry and Agriculture Ministry. NGOs function as consultants for this plan, giving advice on territory and sustainability issues. The participating NGOs acknowledge that the E. has a central role in the problematic.

- MINFOF
- Ministry of Agriculture
- NGOS

## 3. Industry

### 3.1 AES

AES SONEL is a company that is responsible for the supply of electricity in Cameroon. AES owns 5 factories for electricity poles (2 in Yaoundé, 2 in Douala, 1 in Bafoussam) where *E. saligna* timber is processed and chemically treated. The product is sold to the ministry of electricity. Currently the Bafoussam factory only supplies Cameroon, the other factories may sell to other countries especially neighboring countries. The demand is high and is expected to stay high. Electrification is a very important process for employment

“Fournisseurs” harvest, forward and deliver the wood to the factory, which makes up 95% of the wood input. The rest is harvested by AES. Respective markets are in Bui and Ndonga Matong. The wood is mostly from the region, namely from Kumbo, Ndu, Fundong and Nkambe.

There are differences in quality in the plantations, but the middlemen choose only the stems that have a suitable quality for posts.

#### Buying Prices of poles (FCFA)

Length (m)	8	9	11	12
Price (FCFA)	9 000	11 000	15 000	16 000

AES is purchasing ca. 100.000 stems per year, producing ca. 80 000 per year. Production is dependent on demand: 2012: 40 000; 2011: 67 000

Input as well as product prices have been stable since the privatization.

There is no increase of production in the area, at least there is a decrease in harvestable wood. This comes from ever increasing distances since the privatization of the electrification.

Privatization has contributed to the reduction of wood supply, as state owned E. plantations were abandoned, and there has been no policy of reforestation. Before, forest owners were obliged to replant after a harvest. There was the cooperation of State-supplier-private owner. This is not anymore the case. Also, before the privatization, replanting of exploited trees was included in the price of a pole. Reforestation was state responsibility. A stronger role of the state is needed in the opinion of AES in order to secure the supply of wood. The state should connect with the private actors and make money (AES). AES is working on a cooperation with the state to cut and replant in state reserves. If this cooperation does not materialize, a cooperation with "Fournisseurs" is planned.

AES sees a research need in the development of other species (than e.) with same fast growth, but without negative effects on environment. They would also like to quantify the reforestation that would be necessary to cover the demand.

Actors AES is in contact with are:

-Communes (state property given to communes), especially:

- Commune of Fundong, Bagarte
- Sante
- Nkambe (Outside)

-Middlemen

The production time of an electric pole is 3 month from order to delivery. AES uses the vacuum pressure method to treat the poles.

3.2 Sawnwood market -> CIFOR info ?

80 shops that only sell Eucalyptus in Bamenda (all interviewed); E is used very much (CIFOR INFO!!!)

3.3 Fournisseurs/ Trader/ big exploitation companies ->RL, contacts, CIFOR ?

There are differences in quality in the plantations, but the middlemen choose only the stems that have a suitable quality for posts.

An electric pole is worth 1 000 free stem

Electric pole free plantation road, debarked is 1 000 to 2 000 ? ? -> Contrary to AES info-> high profit margin of Fournisseurs?

Eucalyptus exploitation is particular, not like timber exploitation



### 3.4 Pharmacy industry (?) -Medicinal use of e.

## 4 NGOs

Cooperation with ANAFOR -> AL

NGOs assist communes via nurseries; they produce the material and put it to disposition for the communities

There are Geo references of plantations by different NGOs who do the reforestation, which is also encouraged/ fostered by the central MINFOF office in Yaoundé.

## 5 Farmers/ Ranchers

In Bamenda region there is mainly cows, goats can be found rather in Nkambe

Two thirds of the landscape consists of mountainous areas. Steep mountain slopes make much land not agriculturally usable. Cattle raising is main activity there, if slopes are not too steep. These areas are private property.

The less land available, the more agroforestry can be observed

## Silvicultural

People cut their trees because they show bad quality or if they are in need of cash. They often stay behind the full economic potential of the plantations due to harvesting young E.. Young E. has white wood, whereas older E. has reddish wood. Trees are harvestable as electric poles at 10 years. In Fundong there are trees of dimensions to produce the 2x6. Harvest is mostly organized by Fournisseurs and includes harvest, forwarding debarking and transport to AES or sawmills.

Most important for plantation success are a good planting distance and regular silvicultural treatment.

- Planting distance 1x1 (stimulate height growth)
- At about 2 years reduction to 2x2
- Then a regular check and disbranching (close to stem) can ensure quality
- At harvest: If stump is left with smooth surface that favors water runoff, there is a re-sprouting rate of almost 100% -> reduction of replanting costs

Women plant and look after the trees or establish fields (also in e. plantation?)

We should go to Nkambe and Kumbo, where there is a lot of planting, in order to learn more

Apart from E., another forest species of importance is *Prunus Africana*, e.g. Plantation in Bafut (30 min from Bamenda)

Surface water disappeared after the gallery forest had been cut. However replanting with E. does not solve this problem. On the contrary, the problem with E. plantations is the scarcity of water they provoke. Therefore E. is avoided in water catchment areas and the planting of different species in catchment areas is the most common and currently prioritized action taken against this (Nono).

In Nkambe plantation of adapted species has advanced. E. is not planted where it should not be.

Trees in nursery: Many watershed species to ensure water availability, counter the strong water consumption of E.. At the same time timber production. But also other uses like apiculture support. Growth characteristics of “adapted” and “watershed” species ?

Some species in the regional forestry office nursery, suitable for water catchment areas:

- *Policia fulva* sphedeva
- *Tiama*
- *Cordia afrique*
- *Maesopsis*
- *Canarium*

Primary objective of planting activities of the forestry office is to secure environmental services, especially water

Prices of saplings: E. at roadside (bad quality): 25 FCFA at ANAFOR >1000 -> future planting material and trees planted will deteriorate in quality if no funding comes in .

### Interview 7: 28.06 Forestry official

Difference to minfof : Anafor is a specialised unit if the MInfof providing seedlings and expertise to those interested in planting and following up on plantation activities up to the point of harvest. This also includes forest management training of groups, individuals or companies interested in forestry. They have forest extension workers at each division. ANafor is mostly interested in forest plantation. They supply species from horticulture to AF.

Other groups like MINEP and MINFOF are mostly administrative, giving directives and examining the execution program. Minep is mostly concerned with problems related to climate change and

desertification. There is no clear cut between the MINFOF and the MINEP. Activities and responsibilities of each ministry are not really well defined.

Anafor is the main operational unit of the MINFOF as far as tree planting is concerned.

ANAFOR's objectives have been defined by the national policy and laid down by the MINFOF.

The three objectives outlined are:

- Economic development through tree planting/ regeneration
- Establishment of a knowledge network
- Environmental protection

Of these the priority of these is forest regeneration mostly for economic development. Following this the mitigation of climate change is main objective. The strategy is to plant as many trees as possible making sure that there is no net decline in tree stock.

Reforestation: if forest has been destroyed and forest is regenerated

Rehabilitation: in degraded forest reserves and these are protected

Restoration: Negative impacts on an area are reversed to make it favourable for human use like forestry or agriculture

Reforestation is the main activity of the humid savannah program. This region is an exemplary region for forest plantations. Most electric poles come from this region. Anafor is to encourage planting and advice them how and where to plant and how to manage the plantations. ANafor plays a big role in that aspect.

Mr Nganteh is responsible to the general manager in the main office in Yaounde. They work together studying and validating yearly programs.

There are sensitising programs for the population on tree planting in which people are invited to register with ANAFOR. The first step then is to ask them for their needs and to advise the best options.

Then a representative picture of the populations needs and wishes is made and submitted to Yaounde. In Yaounde it is decided which of these needs can be fulfilled.

Encouragement is made via radio, seminars, school talks, contact with nurseries or at festivals. Each year they know what to do with each partner and they follow up on the actions of each partner.

Engaging with Anafor involves signing a contract about when the supervision by anafor starts, how maintenance will be done and where seedlings will be obtained. These are the daily activities of the ANafor.

There are specific goals for each year. Specific goals for this year were the production of 500 000 seedlings in each ecoregion. This means the regional office and the extension workers combined. Extension workers work with everybody that approaches them and wants to plant trees.

Requirements for the cooperation are the proof of property of land, responsibility, checked via a questionnaire on private background including legal status, number of children, etc and the objectives of the planter.

Activities are clear and set for each planter for each year.

Follow up concerns maintenance, fire tracing, replanting, silvicultural treatments and are done with every plantation. Farmers do not pay anything as this is the service ANAFOR is supposed to provide. ANAFOR pays the extension workers to carry out this activity.

Follow ups are a continuous process. Supervision is done on all activities the farmers do, e.g. fire trace, weeding. This amounts to an average to a yearly or half yearly visit frequency of each farmer.

The legal foundation of the ANAFOR is in the forestry law, stating that there is to be an entity to do reforestation. However, the status of Anafor has to be revised, as there are problems with the legal framework, saying that Anafor needs to be financially self sustaining. Seedlings need to be produced at a net zero. This is however practically impossible.

#### Legal documents

The motivation of the people is the low cost of the seedlings, as anafor carries 75% of production costs, and the service of transportation to their farms.

The farmers interest in planting is mainly economic. Groups are mainly interested in the protection of water catchments via counteracting deforestation of gallery forest and overgrazing with reforestation of local species.

Climate change and the shortage of water are additionally understood to be related to environmental quality and the presence of trees.

The economic motivation has changed in that trees provide cash income in the long run.

Wood is being exported to other regions, which is contrary to the situation 15 years ago. The exploitation of planted trees is very rare on the national scale and a specificity of the NW region.

People in the region have understood the silvicultural modalities of wood production.

Timber can be harvested after 15 to 20 years.

Products derived from tree plantation can involve timber, but also medicinal plants. The production of Pygeum may gain importance and it may be feasible to open a processing plant to produce Pygeum derivative medication for export. Pygeum is used for the treatment of prostate cancer.

People have understood this trend and are planting it in very large numbers. It will be an important contribution to the economic strength of the region.

#### Species planted/ produced list

E., Pygeum, Mahogany, AF species

Cooperation with IUCN, ICRAF, CIFOR, ITTO

Cooperations are to create links or networks with other groups. The cooperations are yet to be more fruitful as they are somewhat bureaucratic. Cooperation should be geared towards the improvement of anafor and the support of its activities, rather than cooperation on paper. Cooperatoin should be geared towards fieldwork. The exchange of information not only on higher level, but right down to field level. For this the cooperation it needs more detailed planning. Anafor wants to know if a tree has been planting and how this tree grows. The question if is the role of other organisation is before at or after planting.

There is no information on volume production or harvest.

There are inventories before plantations, but anafor is not doing plantation inventories for free.

Usually trees are purchased on stem, the buyer selecting them at place. Marketing is not well structured.

Big buyers include electric poles, purchasing for example 1 000 to 3 000 trees, each at 3 000 to 5 000 XAF, and having them cut and transported by contractors. This is the typical procedure. Branches are left and used as fuelwood by the owners. Other big buyers are sawnwood producers.

There is a law or decree from the ministry of some sort stating that for each inhabitant the councils have to plant a certain number of trees on council land. Councils plant economic trees as well. Fundong is a good example. They decide how much they plant, depending on their budget, because tree planting is budgeted. It is an economic activity for the council, they are often already selling.

The council land before use as tree plantation is usually land with grass and fuel trees, but in any case not at all idle land. Councils are also plating in catchment areas now. Councils mainly cooperate with anafor concerning plantations and also with other ministries.

Replanting after harvest is also monitored by extension workers.

Lessons learned from projects are exchanged at coordination meetings tree times a year, where everybody presents their projects and reports. There are also mutual visits as species in nurseries and physical features vary.

There is one extension worker for each division, a total of 7 for the region. The number is much too small, so anafor will increase their number if they are allowed to. Extension workers have their salary and they get fuel for their bikes as well as small other rewards.

Reasons for people not to participate in the anafor initiative are that they do not know about it, or that they do not meet the criteria for land ownership form or land size of one ha. Anafor does not want to deal with people that plant only few trees, although they supply them with trees. Anafor is not present everywhere.

It would promote reforestation to reform the land law in order to make the titling of land easier. This would encourage people for long term planting as they have more tenure security. People are also reluctant to long term investment as they are afraid to forego short term income. This could be counteracted with annual economic incentives for farmers according to the number of years and ha they have successfully managed their plantation. This relates to the REDD+ mechanism. Funding is a central requirement. There are enough laws. Anafor needs money to give farmers just a small push.

The constellation of institutions that work on reforestation is not efficient as it is a duplication of efforts and there are no collaborations and synergies. All institutiouns give money separately and with different foci. There is a need for a platform to know who is doing what. A higher level institution should know

about who is doing what and where to avoid duplication of efforts. There have been cases where councils have accepted funding from two different donors for one single plantation.

The whole reforestation program is controlled by the Minfof. Private plantations cannot be controlled. Anafor work is controlled by the minfof by checking their activities according to the objectives. This involves production and planting of trees, which is controlled.

All objectives are in line with the regional direction and serve as the base for the funds that come from yaounde

Most AF species anafor uses have been known by people for a long time, primarily those to increase soil fertility.

Knowledge provided by anafor involves planting distance for different purposes, silvicultural treatments, tree crop interaction, effects on water catchments, economic returns of trees, silvicultural knowledge on exotic species. This knowledge is readily accepted by the farmers. Local knowledge is not very different from outside knowledge as it is grouped into the services the trees are to provide.

The forest sector contributes considerably to Cameroon's GDP, which is why forest should be of interest to the government and some of these revenues should go back into reforestation activities.

Bafut Ngemba was to provide fuelwood and timber, but the management entities (ONADEF) became dysfunctional. The regional delegate is rather concerned with administrative tasks, so it would be anafor that would have to manage it. However the state does not, because it has to transfer management responsibility to councils, which in turn have no resources to manage it properly. The councils could consult anafor for management advice. Bafut Ngemba has not yet been transferred to the respective councils on whose land it is, because the government wants it to be managed holistically by all three councils and not each one on its territory.

List of forest reserves that have been transferred to councils

Bambui has been transferred

## **Interview 8: 27.06 MINEP official**

What do you know about the plantation activities in this region? What is going on?

Most of the plantations are individual plantations of E.

E. is the most planted tree species for individual benefit. It is sold for the construction of houses, E. in small dimensions is sold for poles that serve as scaffolding. The most common plantation species is E. as far as trees are concerned.

In the regional delegation of the environment we have started discouraging the plantation of E. in water catchment areas. Because of this initiative of OTRO, we now even assist in the planting activities of environmentally friendly tree species in water catchment areas. These species are indigenous tree species as there is the danger of invasive species. We therefore encourage the planting of the already identified native species. There is also *Khaya senegalensis* (savannah mahogany). This is the kind of conservation of sustainable water resources for the current and future generations. These are the main activities concerning [plantation activities].

In terms of NTFPs the people here are just trying to introduce certain tree species. In the Batibo area (Momo division) there is a lot of cola nut plantations. IN Kumbo there are apple plantations. There is the REBA resource center. They even practice vegetative propagation and grafting. Many other people are attached to that resource center. It was an ICRAF initiative like others in the country. Apart from that the plantations that can be found in this region is generally E.

Where are these plantations?

Many individuals plant them on their farms. But they deplete the soil quality and suppress other grasses. So we advise them to plant E. in marginal lands, because there E. is still doing extremely well, and thus the farmland can have other trees like fruits. At first these [E.] plantations were just planted everywhere. Now Oil palms are being introduced somewhere in Nkambe in Mesaji (Ndonga Mantung division). Then there is tea plantations in Ndu as well as coffee plantations somewhere.

I drew most of my expertise from my work for NGOs.

What is the main goal of MINEP in Bamenda?

We have the same as the national goal. The sustainability of the environment, a better management of the environment. This includes biotic and abiotic features. Therefore one of the main instruments is the brigade, which monitors the different enterprises e.g. on waste disposal. Thus the MINEP can control the enterprises regarding their compliance with environmental regulations. Another field is the supervision of the waste disposal sites. The suitability of dump sites are being assessed and results forwarded to the councils. There are also controls of sewage in commercial and gastronomy businesses. We give proposals of improvement. We educate, we sensitise. In fact sensitisation is one of the main aspects of environmental protection, because we cannot succeed without the population, which has to be aware of the way it disposes of waste and act environmentally friendly.

How do you sensitise?

Sensitisation: We do flyers, radio talks, we work in cooperation with NGOs, which also have radio talks in other radio stations. As a state establishment we are conservative. There are also environmental education quizzes. This also helps to understand their level of environmental knowledge. Still, we struggle to find a way to introduce environmental education in secondary school. In that cooperation we approach each school. One possibility would be to introduce a school subject of environmental education in secondary school, because it is already being taught at the government teachers training colleges. So one very important step for us is being able to manage our waste. Another step is the change of consumption and production patterns. There is much food that is being wasted leading to waste problems, hunger and at the same time immobilising resources, as farmers produce high quantities of food. Therefore we started a campaign asking How much is enough for you?

We encourage sustainable agricultural practices and e.g. the prevention of brushfires through sensitisation of division level. They group farmers and work together with NGOs to do this. We work especially with NEST-Cam to carry information to the farmers.

What are the different actors involved in plantations?

In divisions like Boumba in Kumbo where there are large plantations of E. that is being used to produce electric poles, the divisional delegate should be able to give you this information.

What do you know about the planting and management practices?

In a reserve, a fire broke out and damaged trees. They needed to write to the minister to harvest and sell the damaged trees, which was necessary to replant. Other than that, ANAFOR is always there with seedlings as well as assist councils in planting ornamental trees in town. They provide, we provide, MINFOF also provides, so there is a network of collaboration. The protection of the environment is a collective effort for us. When it comes to individual plantations, there are many many private nurseries. E.g. the Reba in Kumbo. Here in Bamenda there are many nurseries. There is also a nursery at Nterikon (former hospital). There is a nursery at the forestry delegate. Most nurseries in Bamenda sow E. when the rainy season is approaching. But there are integrated nurseries which were created by ICRAF in cooperation with NGOs that even have vegetatively propagated or grafted planting material. Of the plants that are being produced, some are sold in the market or junctions to farmers that want to plant in their fields, e.g. fruit or native but mostly E. plants.

Individual plantations are managed in a local way, the plantations are not structured and trees are haphazardly planted. They do this because of a lack of knowledge and reluctance to get advice from a technician, because of ignorance or lack of finance to pay the technician.

The regional division goes to the field only in campaigns to demonstrate planting techniques to schools and environmental clubs. We do not have the time to be with the local communities, so we strongly rely on NGOs to do this. Our work needs to pass through this network, so the MINEP also supports them to work with the communities.

What are planting modalities?

Silviculture and planting distances are mostly dependent on species and on the planting environment. In fertile soils only the topsoil is removed and later filled up. In infertile soils we used poultry manure in planting holes.

What were the objectives of these planting activities?

MINEP: Mitigation measure of climate change to improve the microclimate in town. Create a green city to increase life quality especially on climate.

What is the follow up?

Follow up on plantations by MINEP: It is indirect. The first year I went, the second year my colleague went. The report was sent to the ministry. The councils are in charge of the follow up, as the plantations were on their land. The reforestation of catchment areas with eco-friendly species is being controlled by the Nkwen water catchment project. They provide water locally to the concerned villages under the program to combat desertification.

Especially during dry season, the water table sinks considerably in some places, reducing water availability. In some cases the cause is the plantations of E. Under the framework of the combat of desertification, we encourage the harvest of all E. in these cases, replanting of the catchment areas with native species and planting E. on marginal lands instead. We also strongly encourage to consult the local technician, as local species and suitability also vary. E.g. planting cola in agricultural land or Raphia in wetlands.

How do you see the cooperation with the other ministries?



Cooperation: Minfof and minader are two other ministries concerned. The collaboration was bringing some conflicts at first. The main problem is a clear outline of activities and programs that is to be carried out by the minfof and Minep. There are activities that are to be carried out by both like tree planting. Everybody should be part of the tree planting. Some people may ask why they should plant trees and the MINFOF and MINEP will tell you, the technical assistance is there. Minep cannot only do its own activities without cooperation. For instance there is a conflict of the colonisation of wetlands. These wetlands are even protected by the 1996 environmental law and serve as biodiversity reserve, carbon sink and water reservoir. All this is known to the minep and has been communicated to the council, but the council has the power to decide ultimately as it owns the land and wishes to generate income from its sale as residential area. Minep has assisted the council in identifying risk areas for landslides and ecologically endangered sites. But minep can only assist. The decentralisation has given the authority back to the council, but it is not easy for the council as they are also very dependent upon money. The council might look for funding from and collaboration with international organisations. Minep is intending to make a city map including ecological risk zones and water drain zones including infrastructure that may impair it. The government delegate is the mayor and in charge of the town. So this creates conflicts. The decentralisation has led to authority in the hands of non-experts and legislation needs to be harmonised. Minep is trying to educate them and also the population. The only institution to harmonise different ministries is the prime minister. Reports and proposals are sent to the vorgesetzer delegate, but it is not necessarily passed to the minister. However, if you work with NGOs like the NEST-CAM it is easier to be heard because they have the authority to talk directly to the minister.

How has the situation of the plantation changed?

In Nkambe, there was a water crisis due to E in water catchment. They were informed to plant native species. The number of native as well as E. plantings are increasing.

Motivation

Most farmers plant E for economic reasons. E. is fast growing.

Driver of increasing plantations?

Driver of planting: Now the people know that there is a market for e. there are many products of E. There is a high demand and high prices.

What is the reforestation policy of the central government?

Concerning reforestation, the central govt is working very hard. ANAfor plants and donates trees everywhere in Cameroon. Minfof also plants and donates trees. Anafor is encouraging native species, e.g. *Khaya senegalensis*, by making them available via multiplication. They play a role in the prevention of fires, as E. is fire prone in the dry season.

In ecological risk zones like hills, shrubs and grass need to be planted instead of E. Grass will prevent erosion and shrubs have a lower risk of falling and creating erosion. The problem is not the amount of reforestation, but what is to be planted and where as demonstrated by the negative impacts on water from E. planting.

The progress of local private plantation is being evaluated by the local AGric officer. The planting of trees is for economic purpose and therefore his perspective is suitable.

ICRAF used their NGOs to create resource centers for farmer training in nursery creating, grafting, cutting, macotting and seed propagation, relying on knowledgeable NGOs for capacity building. These resource centers are the bridge between farmers and research institutions. The researchers keep records of lessons learned and problems and the information obtained is forwarded to senior researchers.

Information on environmental issues must be documented in order to influence policies.

ICRAF is using the participatory “farmers first” approach, including them in decision making on which species they want to plant.

Communities play a big role in tree planting. They are changing their behaviour only gradually, with cattle being an opposing force and also contributing to land degradation. Thus, shrubs for fodder and soil fertility improvement (Khalandra) need to be introduced, but herdsmen are reluctant to plant, possibly because they do not know about the properties of the shrub.

Councils do not have plantations. Legally, councils have the right to forest after the 1994 law, but it is rare. Community forest is more common. These organisations have a management committee and need to have a nursery. They exploit the resources of the forest, e.g. timber, bushmeat after official guidelines, controlled by the local technician.

Council forest in the NW with trees of E. would however be an activity that could bring money to the councils in only a short period of time.

People are already interested in reforestation, but there is a lack of finance and land. Many have one, but not the other.

A problem is the long period to returns from forestry, especially for poor households, that depend on short term income. Therefore a training on diversification of income sources is needed e.g. via AF. People can bridge time to tree income with livestock. AF also provides medicinal plants and the domestication of NTFPs like, snails, mushrooms, apiculture and gnetum africanum (eru). Vegetative propagation can shorten time to harvest and provide off season harvests.

AF is a very promising activity for sustainable management of land including the socio economic component.

Farmers that received support and are experienced in AF technique must be encouraged to support farmers that are just starting.

An important administrative and political requirement for the promotion of these activities is the formal acknowledgement of the role the ICRAF is playing. The next step is support the organisations, created by ICRAF that link research and grassroots organisations.

There is no clear policy in many aspects of AF, e.g. on NTFPs, so ICRAF is working in this respect. Currently NTFPs are covered by the forestry law and thus calls for a collaboration with the forestry, but ICRAF should play a big role in agricultural landscapes as they already have experience and a network of working groups.

Legislation must be refined in form management plans, e.g. to encourage councils to plant *Prunus africana* on council land or on the management of NTFPs including the role and the way to involve the local population. Currently NTFP collection may conflict with existing laws and guidelines, e.g. of catchment and forest protection.

The local knowledge on the use of plants needs to be studied and shared to extend the width of possible economic activities for farmers.

The importance of AF is also reflected by the high number of farmers that make up the poorest part of the population.

Reforestation: simple replanting of an area that was forested or replanting after harvest- replacement

Rehabilitation: does not apply to trees but to land. Bringing back to a certain state, e.g. soil fertility via the introduction of certain species

Restore: bring back to a state of a certain time

The importance depends on ones perspective. Tree planting should always be rehabilitation.

The MINEPs work:

- Sensitisation: communication and documentation
- Problem identification
- Control and inspection

### **Interview 9: 01.07 Forestry employee**

People plant for economic reasons, there is a good market

Products: 7 years E.: Pole, 10 y: wood or pole, 25-30 years: good timber

90% of planters are not involved with ANAFOR, Anafor is mostly working with organisations. Privates involve with anafor to additionally secure their tenure and insure against timber theft.

Fournisseurs sometimes buy whole plantations. There are many plantations of 0,5 ha,

Private planters just buy seedlings from marjet, thex are not interested in help, as E, is easy to manage and no fertilisation etc is required.

Subsidies to planters consist 70-80% of tools.

Most E. is planted on marginal lands, e.g, on hilltops

E. s also used to restore fertility of agricultural land.

Most E. is sold in Bamenda, poles are directly transported to Doula for export, or to Bafoussam

### **Interview 10: 12.07 MINADER Official**

Since the split from Minfof, the ministry is not working on timber species anymore. Regarding trees the work with on fruit trees, the creation of nurseries and the education of farmers on the setup of nurseries.

Farmers like planting fruit trees, as excess can be sold for cash income. Main products: 1: Avocado, 2: Mango, 3: Plum

In general production is low and orchards are unprofessional. Most farmers have only few trees each.

Minader does AF training, but they do not want to involve in non-fruit trees in order not to conflict with Minfof activities

### **Interview 11: 03.07 Forestry employee**

Context info of Anafor planters:

2 Associations have partly abandoned their plantations, because of neglect and building projects.

One farmer planted Malaina around his field, as it resists drought and keeps the border intact. He plants E. in aggregation for money on land bought for this purpose.

The production of some seedlings for the divisional nursery are outsourced to private nurseries. Species selection is made dependent on site use. AF on farmland, fodder trees or shrubs on pasture, water species on catchment areas.

Anafor approached a school. Usually people will plant if they have land. The purpose of the sensitisation is to present the work of anafor to the people. It is difficult as people are often sceptical. Sometimes people demand seedlings, but fail to care for the plants. However, she does not like to visit plantations as often people are not around.

School planted on land allocated to teachers behind the school. AF with Maesopsis, cassava and Maize. Distance 4x4m and 3x4m for cassava. The teachers will own the trees and crops. Planted one year ago. Some trees suffer from the farming. On the school compound ornamental trees were planted: Mailaina, Podocarpus. All seedlings came from anafor.

They decided for Maesopsis as increasing fertility of the soil was their priority.

Anafor nursery employs students, motivation and technical execution often hard to supervise.

Tree species choice depends on former land use. People want trees as income generating activity. Fast returns are the most popular, e.g. with E.

The possibility to derive many products from E. are a big motivation for planting. People also want to become independent from others for fuel and construction wood.

People of all ages want seedlings, but the economic component is more important for older people as a retirement, whereas the autoconsumption component is more appealing for younger planters.

E. is not good on farmland, degrading the soil. It should be planted on hills and marginal lands as it still grows there, but not on farmland or watersheds.

She is working with a group around ICRAF that engages in grafting and macotting. They produce e.g. kola trees. Anafor has trained some of their technicians there.

Anafor is contacting people by just choosing, groups are easier to find. They practice grafting and macotting together, but some are very negligent about the projects. They also call if they need help and the technicians will come to visit them. Anafor is giving support for these activities.

Anafor is mainly concerned with reforestation and regeneration and the establishment of plantations, with the objective of timber and medicine production and the increase of forest area. In contrast, ICRAF is working on modern techniques of restoration and improved species in order for farmers to maximise income their land and to create species diversity on farmland via horticulture and AF.

The lack of land is a hindrance to tree planting. Councils and the govt are reluctant to allocate land to people to plant trees because they do not want to forego the possibility to make money there. They rather choose to plant themselves, because they also need revenues for the public works. They also need to keep a land reserve in the face of the growing villages. Population growth intensifies the demands for all resources and councils have to try to satisfy the demands of the population.

Onadef used to have extensive plantation forest, like the state reserves Bfut Ngemba.

If people do not have land they usually buy land or exchange other goods or make rental or other agreements like giving part of the harvest.

Landless people form groups and use the land they can find. However this can create conflicts if ideas on crop decision diverge after some time.

24:00

There are some people (Fusmit) that plant trees on the land they have available from 1 to 5 ha. However some jealous natives set fire them. They demand that the benefits of the plantations be shared with them.

Too many people are only demanding help, but the only way can be to instruct the people on how to create values of their own. That way the motivation to keep the project is much higher.

The demand for help by farmers is high, but the govt resources to support the anafor or icraf program are very small.

Experienced famers that are successful planters through NGO or govt help are supposed to support other farmers that just start.

The motivation for farmers to maintain a tree plantation is directly related to its value.

People may be interested in planting, undrstanding the importance of trees, planting, but then abandoning the importance. The may equally request seedlings and waste them. Anafor Ndop does not sell plants, but only gives them away, especially to those that do not have the means to plant.

The farmers get technical advice. They ask when they come to the nursery. She gives advice on planting distance and suggesting species. She needs to keep records of which farmer planted which species in order to be able to direct interested farmers to look at the trees that were already planted and to facilitate networks between the farmers for mutual support.

She will always visit the site before giving out seedlings to make sure sedlings are not wasted.

Fostering efforts requires financial and material support to farmers for plantation maintenance. This support was given to them before.

Plantation establishment can create jealousy as people think that the planter has a lot of money.

Part of the Balikumbat council plantation was burned after fire tracing. They depend a lot on Anafor and the forestry service, especially after the fon, a big supporter of the plantation, died.

People cannot understand the motivation of the anafor workers and think they must make a lot of money. There is not much volunteer spirit.

Anafor can only work with those people that are willing and able to plant, as they cannot buy land or force people.

The exploitation of trees at a certain age is to be part of the anafor contract as to demonstrate the typical cycle and profits of a plantation.

Anafor is very flexible in the enforcement of the contract, setting up a contract with changed conditions in case the situation of the planter changed, by doing part of the work that was supposed to be done by the planter or giving financial support. They try to sustain the peoples motivation even at financial loss and personal sacrifice. However the work is often not acknowledged by the forestry service and the head office. This results in putting more pressure on the planters to care for the plants. The motivation may only come with time.

People are hard to convince to plant, because people fear that the plantation may be destroyed by cattle.

People also exploit shrubs for fodder, especially in the dry season. The sale of the shrubs from foreign land to cattle raisers is a source of income for poor people and prevents the reestablishment of natural vegetation and contributes to degradation of the land.

But the degradation is also a source of mentality change as farmers that have exploit all tree and shrub resources come to the service to ask for advice and seedlings to replant the land.

She feels the pressure from the service to achieve results (but evades further questions).

Extension workers have the same problems, but also species specific ones.

In Ndop the people did not want to plant more E., they were cautious not to harm their farmland. But the other species are more expensive than the E. and take longer to nurse.

The motivation for tree planting is also changing with the commodity prices and the return of the alternative land use.

The other species may grow slower, but have more value. As people are reluctant to choose them, Anafor is also promoting E. more to involve people in planting anyhow. She does not know how to promote the other species more.

It is not easy to get the seeds for the nurseries. Good quality E. seeds are difficult to get as it requires the collaboration with the fournisseurs.

Private nurseries suffer from low seedling prices.

### Interview 12: 08.07 Forestry employee

Communal Forest of E. first planted in 1960 with trees ready to harvest as the 3rd rotation. 1x1m or 1x2m distance. Good quality very straight stems no branches. Only outside stems have low branches that are occasionally being pruned.

Thinning are being done and even for this the cutting tax of the council applies.

New plantation directly behind in Taungya. Age 1. Species: E., maesopsis, avocado. Food crops sweet potatoes, cassava and maize. Planting distance of 2x2m. fertiliser use, E. already at 2 m height. Farmers care well for the trees, only problems is turning soil too close to trees, which damages their roots. Regular pruning of lower branches by council workers.

The objectives of Anafor: sensitisation and explanation of objectives and rationale. Starting with the village head and up to coming to festivals or reunions. Interested people come back to anafor and they are being told what and how to proceed. Anafor workers have to move a lot to reach as many people as possible. People are encouraged to spread the word to friends and relatives. The publicity over the radio is only partly working, as the people want to have a face with the service. Also it is important to see the land the people want to plant on and what they want the plantation for in order to make recommendations for species choice. Even within one area like fruit plantation, there are many possibilities. Anafor is giving the farmer options based on what anafor can offer.

In case of land scarcity, farmers are advised to plant trees on their marginal land if they have any. Otherwise food crops or AF are advised.

Information on terrain that is taken into consideration includes soil fertility, slope, water availability, streams, etc.

Sometimes it is not possible to see each land because of time constraints and long distances to the plots, as he is alone.

### Interview 13: 08.07 Council official

He is [position deleted for anonymisation] to the Fundong Council and has been working in this position for the past 3,5 years. The Fundong Council is a pilot council for regeneration. Planting of the communal forest has been a central element of their activities. The past 2 years the govt assisted them financially with grants of 5 000 000 each to plant 4 000 trees. This was accomplished. They took the seeds from Anafor. The anafor extension worker (Moses) gave technical all the advice in these operations. Moses had come that morning to plan the assessment of the plantation regarding replanting needs, maintenance quality and general condition. He was given free hand to do this with the forest attendant (head worker for council works). Another 5 ha have been planted last year.

Moses is to confirm that the plantation has been established properly in order for the council to have the use of the money justified. Equally he should confirm the status of the next plantation as ready to start in order to facilitate the flow of respective funding as soon as possible. There are sometimes delays of the flow of funds until the dry season, which is taken advantage of by other mayors. The transfer of funds in

the dry season is taken as excuse for the small number of planted or surviving trees, when in reality only few trees have been planted in the first place and the remaining funds have been embezzled. However, this does not happen in Fundong, as with the approval of Anafor to provide 5 000 000 for tree planting this year, the Council takes action and buys on credit if funds are not yet available, in order to maximise planting success.

The efforts have been recognised by the govt and make spontaneous unannounced visits to the field.

Now they are using the Taungya method. Farmers can farm the plantation land until the canopy closes after having applied to the council, until all plantation land is allocated. They plant maize, beans and sweet potatoes, crops that can be harvested on a yearly basis. The council supplies the farmers with 10 l of fertiliser each. The advantage of the method is the high level of maintenance the trees get through the agricultural activity around them. Food crops are less competition than wild vegetation would be. Farmers also prune the trees. Fertiliser provision is conditional on tree survival. There is even a plan to start a competition on the highest survival rate of trees on the farming plots, with prizes for the highest. Apart from the fertiliser, the supply of basic work equipment like hoes, rain boots, etc is a very good motivation for the workers. Equally they had a funding partner...CUTS OFF

The plantation is on council land. Council land is state land, with the govt being the owner, designated to be used by the council as govtal entity.

The land was virgin land used by peasant farmers, grazers and hunters. There were wild trees, which were cut, because it was not possible to manage them and replaced with E.

After the farmers stop farming on the land they will not have any role in the maintenance of the plantation. It is the sole responsibility of the council to manage the plantation.

The selection process for the farmers starts with an application to the forest attendant who registers the women. There is a small meeting on the farming practices and restrictions, e.g. Ankara (burning of grass under soil for charcoal in soil. Fire in general will automatically end the contract of that person. Anybody is eligible also migrants. The demands of each farmer are matched to site conditions, e.g. swampy land for someone who wants to farm coco yams.

People using the land before have no automatic right to continue farming there, but they may equally apply.

Mr Moses is the focal point for anafor so his control of the plantation is a central requirement for the acquisition of new funds from anafor for further plantations. The sections that have been sponsored by the govt are observed by teams from yaounde. They also study the process and write a report. Moses as focal point for anafor knows the species and the process from the start and assists with his expertise which is another form of support.

Cooperation with NGOs could be in the form of material support like hoes, rain boots, etc rather than money. Finances tend to be misused and are thus less effective.

Other councils are also planting with funds from anafor, e.g. Kumbo.

If they would have to pay workers instead to maintain the plantation, it would not be feasible financially.

Private people are more interested in immediate gain. They cannot afford to let the tree grow to a size where it can be exploited profitably. They also do not have the possibility to acquire land. It is not possible



for smallholders to get a large piece of land. There are land disputes and the formalisation procedures are long and strenuous. The administrative machinery has made land acquisition very difficult. Many young farmers that want to grow food or cash crops do not have the land. They work on ancestral land that formally belongs to the government. It is the govt policies that require a lot of bureaucracy and transaction costs through travelling and local land disputes that make it so strenuous. Many people give up before they get their land titled.

2011 the council planted 10 ha from two different sponsors. One is the central administration of the MINFOF. They gave a sum of money with the objective to have 5 ha planted. Anafor's objective was to have a planted area of 10 ha so they decided to sponsor another 10 ha.

This activity has started in several other councils, although not all have received funds from the govt and from anafor at the same time. As plantation efforts are advancing well, there are more funds as an encouragement.

In his first year he started an initiative planting 800 ornamental trees along the road, but most were destroyed by animals and humans. The next public initiative he envisions is to have one tree planted for every child that is born, by collecting 500 XAF at every birth and having it planted in a given area, e.g. along a road or on council land.

Commitment to environmental initiatives is very dependent on the current mayor, which is particularly difficult to establish a tree planting culture.

Motivation to plant the communal forest was the projected scarcity of wood in the future. Common people cannot buy gas or electricity for their fuel needs and with an increasing population the demand for wood will further increase. More trees are cut they are planted and the resource use is very inconsiderate. Therefore the council forest is designed as a wood provider to the population in the future.

130708\_004 13:37 ???

Good quality can be used for construction wood, other wood for fuel.

The objective is to have 50 ha of council forest here (Fundong) in response to the scarcity of fuel and construction wood that will develop in the next 20 years. By then many people may be sensitised so that the private sector will also contribute to wood production. The council intends to sell the wood to the local population. They will only sell to SONEC under very strict negotiations and under the condition to electrify the Fundong area.

There are different species that are fast growing like Khailandra. Pygeum may develop into an important industry with the opening of a transformation plant nearby. However planting needs to start now in order to supply such a factory.

The rocky land here favoured the E. which was main reason to choose this species. For water courses other species are used.

For technical advice they completely rely on Anafor and the divisional delegate of the MINFOF. They are never conflicting because the council is another arm of the government and the govt has so many different activities. ????

If you plant in September, the trees will still survive in fundong because the climate is humid. In other places, trees planted after June will not survive.

Assistance should not be permanent, but rather punctual and very specific. Specific demands should be made by the concerned planting entity to specific donors.

With a good political or administrative strategy it is possible to attract a lot of foreign funding, e.g. from a twin city.

#### **Interview 14: 05.07 Council employee**

5 ha of Mahogany, *Maesopsis*, *E. timber* species, many species. About 6 000 plants. Species mix and ratios are due to seedling availability. Species were not mixed but grouped according to terrain. Species were chosen because they were provided for free by Anafor. *Maesopsis* will be used for white wood timber, others will be used to charcoal. The forest is about 6 km from the council. Planted 3 years ago. The soil is fertile and can produce anything.

The objective is to generate income for the council and to support the communities, which can apply for wood donations for certain projects like schools. The amount will be decided on a case to case basis and depending on the wealth of the community in question.

The land was obtained from the village heads after solving a problem with the grazers (*buroros*). At a meeting with the delegate of livestock and the grazers they gave some of their land to the council. The govt gave land to the grazers to make them sesshaft. Before they were landless and moving around grazing other peoples land. They govt took land from other peoples traditionally owned land and gave it to the grazers. The govt cannot take formally owned land In return, the grazers and other villagers gave part of their land to council to plant. Villagers were still claiming the land as theirs.

Motivation for tree planting is to provide wood for the communities. The demand of wood is too big for the existing council forest.

The initiative is a pure council initiative, the govt is not involved. Support in the form of gas or a vehicle would be good to cover the distance to the plantation. This could come from an NGO or the govt. They could also use herbicides and sprayers.

Seedlings came from anafor. They are expecting funds from the govt, but he is not sure how to make the request.

They are working with the Minfof and anafor, but he could imagine a better collaboration, because they only inspect the plantation, but do not instruct the council or workers on what to do. This lack of practical knowledge would be a leverage point for research cooperation.

Advice from anafor was even better for the council plantation than for his private plantation, because other people from the council were involved that also gave advice.

Council workers are doing the work on the plantation.

As they got the seedlings and the land for free and they employ the workers anyway, there are no large investments connected to the establishment of the plantation.

### Interview 15: 03.07 Council employee

Plantation of E and Pygeum and a few trees of another species in Waowa fondom (pamal) planted three years ago and small Avocado plantation behind the coil house that just started bearing.

Species were chosen because of their suitability for the area, which is homogeneously hilly.

A big area was cleared and divided into compartments for the different species.

The rationale behind planting was to follow the govt's request to plant trees to combat climate change. Also the sale of the E products like electric poles, sawnwood or fuelwood is to provide a source of income for the council. Also Pygeum has a market and is to be sold. Mahogany was not planted due to climate restrictions. Anafor gave suggestions on species after asking about the council's budget.

Both species are to be harvested by private exploiters.

Land was given to the council by the villages upon demand because the council wanted to follow the government's request to plant trees.

The land was used "just" for farming and cattle raising before.

Every fondom was asked to allocate land to the council for tree planting. The existing plantations are only from some fondoms, but the others will also give land. Once the council exploits the plantation, the villages will participate from the profits. How or how much they benefit is not yet decided.

The encouragement of councils to plant trees is a govt policy.

Anafor and the forestry delegation technicians provided technical assistance and did pegging. Seedlings were partly purchased at Anafor the others came from the Minfof. The trees were planted by council workers after instruction by Anafor and Minfof staff.

The advantage of the support by anafor is the supply of seedlings and their quality

Government support are subsidies for tree planting activities in general. 13 07 03 003: 9:02 The ministry decides to give money to some councils. Criteria for the eligibility are unclear. The amount of money depends on the institution, each one gives different sums. The council received 5 000 000 from the central MINFOF, however documents were not available at that time. The money was granted before the acquisition of land or redaction of a project proposal

The council must plant trees in order to justify the use of the money. There may be controls from the central ministry checking the plantation. There are no specific objectives for the plantation in terms of size or services, so specific area and number of trees are not part of the control.

There are no specific data on growth speed, as it seems adequate. Inventories of some sort exist.

Protection includes fire traces and possibly fencing in the future.

After harvest trees will resprout and the land will stay plantation forest.

He cannot make a statement on trends in tree planting activities in the region, because it is an activity encouraged by the govt. Govt incentives are effective also for individuals, but there is no funding for them. The most helpful activity of the govt in this regard is education and sensitisation of the population on the need of tree planting. As a consequence people start planting.

Does not know about any cooperations for tree planting.

Consequences if funds are misused are to be expected, but the severity is now clear, as it is a new program.

No knowledge on the distinction between the 3 R. The council is not rehabilitating but afforesting. The govt is encouraging both, afforestation is a first step in rehabilitation. Measures or goals of rehabilitation are unclear.

No idea about the importance of reforestation, but it is a part of the strategy to fight climate change.

No idea who controls the efficiency of measure/ programs. The council is supposed to control the efficiency of their own planting efforts. However, there is no report on this, neither planned nor demanded by any side. Money is the main requirement to increase planting activity, as it is needed in the maintenance of the young plantations, paying for work of council workers and Minfof staff.

No cooperations are envisioned, there will only be reliance on Anafor and the central Minfof.

Not all council land was planted, only land designated to forest. Designation is precise, there is no unused council land, just land under a project that is not yet operational. Council land is being purchased or donated by villages.

Council land is encroached, but intruders are fought out.

There is no corruption risk perceived in the plantation activities or their controls, although there is no control of the people who control the plantations. Their judgement is also needed for the provision of further funds.

Research could help with technical aspects.

Middlemen

### **Interview 16: 10.07 Middleman**

They want to be paid. They are indicating the risk of talking to me for their job as they might disclose sensitive information. They know that there is money in research, so they would like to participate from that. The service would include detailed information, transport to the forest, demonstration of all the activities and permission to take pictures, etc. for 500 000. A researcher from the US paid 500 000 to them. I finally paid 10 000.

The electric pole business in Fundong is over, as all the suitable trees have already been exploited and there was no reforestation. These were mainly from the council forest. The amount of harvestable stems in Kumbo is also declining, however there are still regions where large stems are very abundant. These

forests are on private land. There may be 1 000 big harvestable stems in one forest that is made up of 5 different owners. Even though there are large forest areas most people only own small parts of these forests and know exactly where their border is and which stems are on his land. They cooperate with neighbouring forest owners for management and harvest arrangements. Wood is paid per stem. There are places where people have started to reforest.

Kumbo is the stronghold of electric poles in Cameroon.

Mr Bafeng knows everything about silvicultural practices in this region as well as the terrain. Sonel is even asking him to scout for them.

They harvest the stems for electric poles wherever they find them but mostly in Buy department, e.g. in Kumbo and Ndu. Here people plant E., harvest, the trees resprout to grow again and the plantations are even extended.

The resprouting is guarantee for replanting. There may be up to 5 shoots from a cut tree. They know all the planters, but there are very many. The forest area each owner has depends on organisation within the family and repartition of inherited land.

There are land sales even with standing trees. There are small ownership structures. The biggest forest owners have around 2-3 up to 5 ha, the majority has around 1 ha. Most have agriculture at the same time, but somewhere else as there is competition for water.

One possibility is to use line planting as live fence for cattle that fertilise the soil. Cattle usually stays for 2 years after which the field is used for crops like beans, Maize or potatoes or vegetables.

They choose the best and straightest stems, count, purchase and cut them.

They pay taxes on returns from pole sale to sonel, council tax per truck.

There are differences in qualities in plantations. This depends on exploitation intensity, as a very open stand hinders height growth and closed stands grow faster produce better quality.

Planting distance depends on terrain, especially on water availability. In swampy areas 1,5x1,5m is good. On the terrain 1x1m is possible. However planting this difference has negligible effects if thinnings are done well. The bad quality stems should be taken out once competition becomes too strong.

On steep slopes seedlings should be planted with an inclination towards the slope to prevent a curve of the stem as result of earth movement downslope.

E can dry up swampy areas within 2 years up to a point where E suffers from drought stress too.

There are around 10 to 15 fournisseurs that supply poles to Sonel. They hold meetings about weekly goal and difficulties they face and how to improve their association. They discuss and roughly fix the lowest amount to pay to forest owners without discouraging them to plant and try to fix and increase price to sonel. The transportation is a main cost factor and much dependent on the quality of roads. The bad roads can cause delays and one day will cost an extra 50 000.

They are in charge of cutting, moving, transport.

Transport to Bafoussam from Kumbo: 450 000 for usually 2-3 days

Nkambe is 550 000

Ndu 500 000

One truck can transport between 40 and 100 stems. The long stems are usually 60 per truck

Sonel pays for different qualities and sizes, but farmers are only paid according to size between 2 000 and 5 000.

Harvest involves selection, cutting, debarking, manual transport to the next road, loading.

Payment to the council is 5 000 to the forestry service 2 000 for the certification of origin.

The biggest problem is the outlook on shortages in stems of sufficient dimension. In 15 years there may be no more stems left. The available stems are too small. The shortage may be caused by the harvest of small sticks for scaffolding. There is a high demand, as they are single use and utilised as fuelwood despite their high quality stems. The harvest of small trees should be prohibited by the Minfof. This would need to be broadcasted on the radio too. Scaffolding could just as well be done with beams from large trees.

The big stems are used for beams. They also produce beams from big stems they buy. They cut them free hand with a chainsaw.

Average supply to Sonel depends on the number of rainy days, which influences moving of stems to the road and especially the accessibility of loading points and transport time to Bafoussam. In dry season they fill a truck each 4 days. There are days that they cut 100 stems a day.

8-9 people move 1 stem to the road. There are lengths of 9, 11, 12, 13, 14, 15m for Sonel. 7m for Camtel poles.

The police and the gendarmes often create problems demanding bribes of around 500 to 1 000 to let the trucks continue. This may amount to 10 000 for one way. They are organised among each other to systematically "tax".

A big pole takes around 10 years to mature. It is still possible to counteract the expected shortage in poles with planting initiatives. There is enough land to plant trees, but the people do not want to plant. He is not sure why, poverty could be one reason as tree planting is considerable work and reduces time for other income generating activities. There is a lack of manpower as much of the young generation has migrated to cities or is not interested due to small returns. Also people will produce less food if they engage in tree planting.

The small plantation sizes also reduce profitability for owners.

There is the possibility to buy land and plant for investors. Large areas could be bought with or without forest.

He wants to retire soon so he is thinking about buying land and forest, but not in Kumbo.

The supply of E. will decline, because small stems are being exploited, therefore the need for replanting is high. There are entrepreneurs specialised in the harvest and provision of small sticks for scaffolding. These are only used once and used for fuelwood afterwards.

There are some protected species but this applies rather in the south. People will never plant these because they won't be able to harvest them.

Politicians only talk about the things they want to talk about

He is open for further questions.

There is no Anafor in Kumbo.

Planters buy seedlings from local private nurseries.

The great E. plantations are in Nkambe and Ndu, because there is less population pressure and occupied land there. During independence movements and fighting people moved away from the villages there to the cities for safety and work and abandoned their land. Also the Bamenda and Babessi regions are much more fertile and attracted agriculture. The government also failed to build a good road thus hindering rural development and making the region unattractive.

### **Interview 17: 13.07 Middleman**

He was working in the fournisseur business. He has a 5 year old E. plantation of 1 200m<sup>2</sup>. He planted for economic reasons. Wood production is the main economic activity of the Buy division. All natural sources of fuel, like trees and the bushes have already been exploited, so that the only available source is E.. Fossil fuels are too expensive for most people.

Most people plant it in order to sell it. With the high demand they can be sure to sell it. They sell the construction wood and the fuelwood as separate products. Sale of E. may make up around 15% of rural household income with the main share coming from agriculture.

E. fuelwood is even being exported to other regions up to Douala.

There is more E. planted in the rural areas further north (of Kumbo), as there is more space. Every kilometre there is a big forest. These forests, although forming a closed canopy, belong to different owners. They know their boundaries. They work together to prevent bushfires and coordinate other work.

E. takes 15 to 20 years to mature at an average height of 15m. This trees can be used for sawnwood. Electric poles can be harvested after about 4 years. Growth speed depends much on the fertility and water availability. It grows fastest in marshy areas, producing electric poles in 3 years. On hills, E. grows a lot slower, especially if not much water is around. The first 3 years are linked to much maintenance there and some may die.

The number of shoots, resprouting from the stump increase with water availability of the land and depend to a smaller degree on age, which is best between 2 and 6 years. Many shoots will compete stronger, promoting straight stems and no low branches. Additionally it gives the farmer more options on choosing the best stem when doing the thinning as well the number of stems per ha. Most E. that grow on rocky soils, like around Nkambe and Ndu can only resprout in the rainy season and dry of cut in the dry season. Marshy areas can be harvested year round.

For the production of big trees a planting distance of 1x1m to 1,5x1,5m is suitable. This distance has to be gradually reduced to 3x3m with thinnings. Trees that suffer from too much competition are not able to catch up diameter growth, so they have to be liberated before they reach a certain age.

Planting only for electric poles planting distances can be up to 0,5x0,5m. Land preparation involves clearing and sowing the seedlings that have been nursed before.

Seed collection is done during the dry season from old trees. Their branches are cut and wrapped in paper, which is put into the sun so the capsules open their pores. The seeds are very small and even small quantities can yield a high number of seedlings.

Traditional practice for creating a E. nursery includes doing Ankara and just laying seed bearing branches onto the soil once it is cold. A nursery of 15m<sup>2</sup> can host up to 1 000 000 seedlings. People put the seedlings in PE bags and sell them at the market.

People are free to decide whether they want to produce small or big trees, because they can get any number of seedlings they wish at the market.

Stems cannot be used for electric poles if they pass a certain size, usually at 6 years. People will not be able to carry it, moving it out of the forest. Also if no care is taken during harvest, the stem can only be used for fuelwood. Also the sawing is difficult, technically as well as exploiting the demanded dimensions of 2x6" and 1x12" beams. This must also be considered in finding the ideal harvest diameter.

He wants to produce fuelwood in his plantation in order support his retired parents with fuelwood. He may sell only 1 or 2 for sawing, that have matured by now. This will be sold to dealers, that usually leave the crown for firewood. Some also buy the whole tree, including the saw waste. This waste is often used to construct pig fences. The bark is used as toilet seat or toilet cover.

There is no fixed rotation age for firewood production, but harvested in case of demand.

The disadvantages of planting distances >2x2m are a higher relative loss in case of casualties, more maintenance work or competition from weed up to failure of the plantation and less stem quality. A high density provides a buffer in case of casualties that ensures a low level of light to suppress the undergrowth and foster straight stems. The higher planting effort is made up for by the smaller maintenance work.

The survival rate of seedlings largely depends on their age at planting, the time it takes them from leaving the nursery until being planted and the season (rainfall). Seedlings that are planted the same day have much larger chances of survival, whereas those that are not planted within 2 days often die. Those planted after august equally have very small chances of survival. E. do not suffer from heavy rainfall, but profit from it.

Often people plant E. on land they find too infertile to do agriculture. If they have other reasons and plant E. next to someone else doing agriculture, this creates strong conflicts, as the E. negatively impacts crops with their root system, outcompeting any other plant for water and nutrients up to 20m away.

The awareness about the high water consumption of E. has led to abstaining from planting E. in water catchment areas around villages. It is less problematic to use it as a live fence in grazing areas that is cut regularly.



The only thing that gives money to people in the dry season is the sale of E. products. People can make money selling firewood, with demand surpassing the production by far. The wood is even used for industrial purposes, like in bakeries.

One pole for scaffolding is usually sold at 300. An electric pole is bought by the fournisseur at 1 200.

The main obstacle for engaging in the fournisseur business is the lack of capital.

SONEL gives out licenses for the fournisseur supplying to them and can equally revoke them. Only licensed enterprises are allowed to supply. The license costs around 3 000 000 and involves a lot of bureaucracy. SONEL demands a number of stems and upon delivery and check, they pay only once the agreed number is supplied.

A rejected pole can only be sold as firewood and is worth only about 1 000 in Kumbo and 2 000 to 3 000 in Bamenda

Fournisseur expenses:

Price to farmer: 1 200 now 1 500

6 people will carry 1 stem to the next road: 300 per stem

Loading on pickup: 200 per stem

Truck to Bafoussam carrying 100 – 80 stems depending on stem lengths

100 at 9m poles

The combination 50 stems of 11m and 30 stems of 9m is common as maximum technically feasible for the trucks.

from Kumbo: 500 000 per truck

Nkambe: 650 000

Ndu: 600 000

Payment to the council: 5 000 per truck

Payment to the forestry service: 6 000 per truck

The payment to the council is a tax on export of products from the division.

The forestry does not provide any service in return for the payment.

Sonel pays: 9m poles

11m poles 15 500

There are people with a supply license that you can sell to if you don't have a license that will take 500 to 1 000 per stem off Sonels price.

This means that if there are no breakdowns or bribes needed, the balance per truck supplied is around 150 000. This has not yet covered the running and transaction costs, like finding stems, making and maintaining business connections.

11 m poles are used for high tension poles, 9 m for providing electricity to houses.

The per-tree cutting tax is not paid. This is covered by the payment to the council and applies only to trees from natural forest.

Being a fournisseur is good business.

2 000 sticks 11 000 000

11 000 000 you make a profit of 3 or 4 000 000 net.

Sonel has the advantage of being a monopoly and can fix the prices.

There is not much competition in this business. The supply comes only upon request by Sonel, so nobody starts to work without having a buyer. What is keeping people out if the business is the high fee you have to pay to Sonel to be licensed. Also, in the granting of this license, there is usually an aspect of corruption in obtaining the required documents.

There are still good trees in his village close to Kumbo, there are also good trees in Ndu, but he buys mostly around Kumbo.

The problem with planting is the unavailability of land. People need their land for agriculture.

Sonel sells an electric pole at around 50 000 plus cable and worker hours. Electric lines cannot cross the street without pole, so often poles need to be purchased for each house.

One unit (kWh?) is 25

Selling electric poles is even better business than supplying the trees.

3 000 000 for 8 000 sticks

1000 sticks each months,

3 000 sticks about 3 000 000

He is looking for an investor to provide 11 000 000 as starting capital as he has no security for a credit from the bank. It is hard to get credit for simple men. Investors take advantage of this and ask for high shares of 50% even 70% of the profits from the enterprise.

There is a need for planting, except in water catchments, which should be left alone.

People have been informed about which areas they should plant as there are seminars on this topic. Businesspeople are told to plant E. on idle land and to convert it to agricultural land once they need it for this purpose. The leaves and remnants of E. will decay and leave a fertile topsoil. E. does not kill the land.

Many people have land that they are not using. The first settlers claimed all the land and others would have to ask them to allocate some for you. Much land is still in their possession. The idea of selling land is just rising with the increasing population pressure. So is the need for more intensive use of the land.

Many people also return from cities or agglomerations to rural areas in search of land. They may have come to the urban areas in search for income, as in rural areas the only source of income is agriculture and E. A family whose land can only produce E. can hardly survive from the money an average patch of land with E. can produce (e.g. 1 000 sticks every 3 years). Many families try to use the externally gained income (from urban areas) as a stepping stone for other income generating activities in their village. Selling and using own fuelwood is a very important day to day element of rural household economy.

He is asking a relative working in USA to invest in medicinal plant (Juheme) plantations, as he may have enough money to start a big project like this. There is a high demand for this product on the world market. It is an erection medication. The bark is sent to Ethiopia and India for extraction of chemicals and then to the US for transformation and packaging. With an initial investment of 20 000 000 returns of 300 000 000 can be expected after less than 10 years. He would rent village land and have them participate in the returns as a motivation to give up their land. However, 5% of the returns are enough for them. Drug business is sometimes bad, but they make a lot of money.

The Cameroonian society is very divided between some that have very much money and the rest that has very little. The rich people get greedier and don't seem to enjoy life anymore. The more important is it that people understand that a handshake is a privilege. People to help each other out a lot and relationships are very important in this society

Private Planters

### **Interview 18: 04.07 Private planter**

Plantation of 1 ha with 1 000 E plants last June.

Cooperation with anafor because there is a lack of planting material in Sabga for a bigger plantation. Decision for E. because it is highly demanded regionally, nationally and internationally.

Trees will be sold after 10 to 15 years to anyone that is interested in buying. He is envisioning a sale of around 50 trees at a time.

Planting distance was 2x2, it was measured. Before there were cattle grazing there. The cattle were migrated to a different place. First the field was cleared, then measured, holes of 30cm depth dug. After planting trees were left alone. Planting was 3 months before the dry season. During dry season nothing was done. No fertiliser, or chemicals were used. Some survived the dry season. Next steps will be weeding, counting of remaining trees and replanting of casualties. He will get some funds from his father to purchase new seedlings to replenish. Protection is the cutting of a fire trace in the dry season of 3 m around the plantation. Problems include lack of funds, lack of fertiliser and insecticide and foreign cattle being herded in the area.

If the E. is at a dimension out of danger, they are planning to plant other tree crops, fruits on another reserved patch of land.

All other land they own is used for agriculture. The cattle was migrated to Bambili on other land they own. Total land in Sabga is around 15 ha.

They do not know whether other people are planting around here, except one person that planted 4 years ago and who was the inspiration to establish the plantation. His plantation was the same size and he probably bought the seedlings somewhere else.

They chose this specific land for the plantation because it is quite fertile and there is a stream next to it. The water availability and fertility will greatly benefit the E.. The land is one of the best lands. However he does not know of any E. plantation that did not grow because of water scarcity. Usually E. grows wherever they are planted.

For labour they relied on the family members.

Anafor just came to see what they did one month after the planting was done. They were not involved in planning. They sent 2 or 3 representatives to assess the plantation.

The trees are a good investment in the future, also benefitting the environment. Compared to agriculture it mainly a source of income. The is income to the family and to the government as well, because of the harvest tax. It is good to increase the govt revenue, so they can invest in reforestation efforts and the improvement of existing plantations.

In two weeks the weeding will be done, and the grass will be removed and fertiliser applied.

After the harvest the use of the land is not certain, in any case it is his father do decide. It might remain E. forest there, because after growing E. the land cannot be used for agriculture as it will lose its fertility.

He knows how to plant from uni, where he studied human and economic geography and heard agriculture lectures. Does not know any other method.

There are not many trees in this area, but people are planting more. Especially people that already have trees increase their planting efforts.

The tree resources in the Bamenda area are exhausted and the urban areas do not allow for big tree plantations. In the neighbouring areas, trees are planted to secure tenure as competition is anticipated and especially to avoid dispropriation by the govt or council development projects. There are problems with people claiming land, especially if you have much grassland without certificate, which is viewed as idle land. Securing tenure by getting a certificate is not common as it is associated with considerable expenses and here (Sabga) many people do not have much money.

Tenure and economic concerns are equally important in deciding to plant trees.

Tenure aspect is possible with all tree species.

Seedlings were given to them by anafor. Anafor is using good quality seeds and seedling are well taken care of.

There are some other places to buy seedlings in Babanki.

There are no farmers or tree planters groups in Sabga and there is no support from outside for farming, because many people are relying much more on cattle raising. They as students have the vision to develop the area for agriculture. Their land requirement for cattle is much higher than for agriculture. There is overgrazing and a high competition for land, so they would like to focus on agriculture to face the land shortage.

Cattle raising is an important income generating activity. All social groups engage in this cattle ranching, as historically, in this region this was the only activity. Now more educated people turn to other businesses or keep cattle for cultural reasons.

Problems for the development of agriculture are a lack of subsidies or access to credit, as well as a good infrastructure for farm supplies. They are missing institutions or services for agriculture. The next one is IRAD in Bambili. Service there has decreased however, because funds were reduced. For cattle, there is a veterinary here that works free of charge.

The area of trees is increasing in the whole NW region from what he sees. Especially in Sabga the change is apparent as there were so few plantations before. Most plantations are E. plantations from individuals.

He doesn't know of any other actor planting.

The govt wants to counteract environmental problems which is why they encourage planting a lot. There are programs on tv about reforestation, especially about the north, where stars plant trees.

No clear distinction between the 3 R.

Govt is encouraging trees to support the ecosystem services. They use the term reforestation and rehabilitation in relation to degraded areas that are rehabilitated, mainly agriculture to (re)attract the population from large urban centers.

Mr Nuhu has a private E. plantation and he is the president of the water project. The Muslims started the project, as they noticed the good quality of the water in Sabga. The catchment plantation was carried out by all the community members, Muslims and Christians. Everybody was mobilised under the banner of community responsibility. There were not yet any shortages of water. About 4 different species were planted for the catchment. All these species conserve the water catchment. Information on these species are from the council that also supplied the trees. The council in turn probably obtained the trees from various institutions in Bamenda.

The water plantation was created 3 years ago and more are planted each year. The cattle destroy many trees or that show slow growth, so the effort is much bigger than reflected by the area of the plantation.

They get the seeds for certain trees on agricultural land owned by the govt called AGRIC. They sell the agricultural produce.

The property was divided by tree planting. A plot ca 0,5 ha was surrounded with line planting of Cyprus, E. and other broadleaves and used for agriculture, currently under fallow. Once the E. needs less maintenance, fruit trees are to be planted here, namely oranges in monoculture. There is still another plot to be planted with yet another tree species, which is however not yet determined. Another plot was planted with special more nutritious grass. Seeds came from IRAD in Bambili, where Mr Nuhu passed accidentally.

The founder of Sabga had more than 1 000 cattle. Later there was a total of 3 000 cattle in Sabga, but since then the number has been decreasing, because the land is not supporting the numbers anymore. The insecurity of the cattle for the livelihood is the reason education gained importance for them. Before they thought education is only for the white and for the Christians.

On an opposite hillside there are shrubs and bushes mixed with fruit trees. Cattle is grazing in between. Further up there are many trees.

Catchment planting is not in good condition most plants are dead and surviving plants, are very small. Distance of surviving plants is about 5 to 6 m. Dead plants seem eaten as they resprout from the stem base. Some planted trees have developed very well in contrast. Plantation was started in 2010 and after high casualties from cattle and repeated replanting the area was thoroughly fenced and plantings and natural vegetation is now developing very well inside the fence. There is a lot of natural vegetation in the form of shrubs. There are trails everywhere. The creek was planted some years ago, and is closed in with big trees. The selection of the area for the protection of the catchment is not very clear.

The land for the plantation was donated by the chief of the village to the Water authority sabga.

### **Interview 19: 05.07 Private planter**

Has an E. plantation of 2-3 ha of 1 500 plus some on a hill close to his house. Is planning an oil palm plantation. The area was grassland before.

He is planting the E in stages. One part was planted 2 months ago, one year ago and 2 years ago. Most of the 2nd and 3rd planting was replanting of fire casualties. He's planning to plant 500 more on the area.

Rationale for planting is to cover his land surface, although it is limited. He wants to produce electric poles, construction- and fuelwood for the family and contribute to reforestation in the area, which used to be forested not long ago. He wants to contribute to sustainable use of wood and secure this resource for his descendants.

The hilltops are already deforested and farmed or used for grazing. People now cut the forest on their traditional land for farming.

The official recognised title, a land certificate requires a land survey. This includes measuring the area and planting pillars.

Upon request, the surveyance team may not immediately come, it involves the change of the catastral plan and is connected to costs. However, it is important to stop encroachment by outsiders and neighbors that try to seize the land, especially with the new law that identifies all traditionally owned land as government land. The govt has to compensate you if you have a formal land title, but it will rather choose traditionally owned land.

All families around here have traditionally owned land.

Traditionally owned property, also houses, cannot be given or sold to someone outside the family. After a heritage the parties may decide to split the property and use it as privately owned parts, the rest will stay common family property.

People are mostly indifferent about planting either on common or individual land. Only the planter has the right to sell the trees. Other family members may only cut and use the wood for themselves and after asking for permission.

He planted E. because the growth characteristics are well known. It grows very fast and straight, producing high quality timber. There are other types of good trees, but seedlings are largely unavailable. Also, E. grows well on hills.

The other wanted species is for example an even faster growing good quality white wood with good durability. Cifor in Mbengwi may have some seedlings of that species.

Contact with the ANafor was made as he passed the nursery by accident. They did not ask about his goals or objectives, but just that he could get some seedlings if he wanted to.

He met an agric officer and some entrepreneurs who were planting E. seedlings.

He paid around 250 per seedling at the market in Mbengwi, at a man that works for cifor with a garden at the special branch. On the road going uphill opposite the new big council, it is on the right side.

To advance his planting efforts he would need more trees, and subsidies in the form of chemical weeding to prevent fire, as manual weeding is very labour intensive. He would also need technical assistance to optimise growth rate and quality through silvicultural interventions. He would like to know more about threats to the plantation from pests. He would also be grateful for fertiliser.

There is no protection against animals. Although there is cattle around but there have not been problems on his plantation, though on others. He would thus like to get some barbed wire, however this is also a cost issue.

He heard about fire tracing to protect the plantation from fire. Preventing bushfires is hard, as it is a cultural thing and also because people may also be careless or may set fires intentionally.

Land availability may not be an issue, as there is extensively used land around, which people may sell or rent.

Harvest will be done by the buyer.

After harvest, the area will remain E. forest. He may remove the forest in case someone wants to use the land to build.

There is an alarming rate deforestation and no tree planting to compensate. This also affects other services like size of streams. If people are planting it is mostly oilpalm.

He used to work with the pan African institute for development, an organisation for all kinds of development, where he learned about deforestation in other regions. He started a village initiative to combat the deforestation that takes place in his region and promote reforestation. The reforestation would be on private land that had been forest before, which is yet to be identified. Land owners will have to be convinced to plant voluntarily, the council could be asked to demarcate zones for reforestation, or a community forest could be created. The community should participate, as the negative effects of deforestation concern them all, but there is little awareness about this. This is a change compared to earlier generations, which used the forest without destroying it. As the traditions that permitted this use are being abandoned the paradigm of sustainability must replace it.

NGOs should supply knowledge about these issues. He himself started an NGO, which is however barely existing because of no finance. He has not received his salary for the last 10 years.

The problem about NGOs is that they are just interested in acquiring big funds. The projects are often neglected after some years. This calls for the strengthening of local NGOs that are connected to the place. They need to get a proper structure, training and supervision and their work will be very effective.

Today, the role of NGOs is dominated by their search for funds. A good approach would be to encourage the creation of local NGOs and to encourage them with materials, input material and technical advice rather than money. The product that is being promoted by an NGO should be consumable or marketable, so participants have an economic incentive. Therefore, the connection to a market is also important and should be improved by the govt. Otherwise the govt should buy the products.

The govt services have the capacity to do some of these things, but they don't. Some are not motivated, as they have a fixed salary. The public work should be objective oriented and performance based to increase efficiency. Govt servants often say, they are waiting for people to meet them in their offices, but people have to be aware of the services, interested in it and entrepreneurial before they consider this. It is these requirements that somebody needs to work on. This could be small NGOs, CIGs or the govt officials if they can be forced to, which may be very difficult. Motivation could be incentive based for govt officials, but performance based approach with strong controls is more feasible.

### **Interview 20: 06.07 Private planter**

He has E., mango and Avocado trees.

He is planning to use the E. for construction wood, harvesting rather big trees. He is aware that there are also uses for smaller trees, so he is flexible in harvest time. He will use the E. either for his own house or sell it. Fruit trees are for autoconsumption and independence from markets for food. Planting is also to help the environment, especially the atmosphere and avoid harm in the future.

The land of the plantation is traditionally owned and he is the sole owner now. Part of the inherited land is being managed individually and part is used commonly. His brother

The land was empty before, then he started agriculture of maize and groundnuts.

Seedlings for Mango and Avocado are widely available because people consume a lot. Seeds are just put into a small hole in the ground and grow. Avocado seeds are selected according to taste of the fruit. Mango seeds are just planted in masses because they have small germination rates. Then the best seedlings are selected and left to grow. Only E. are nursed before planting.

Mango trees were planted because he had to cut the old ones.

Planting E., it is important to not give them too much space to promote straight growth to increase the amount of sawnwood one can get out. He planted at 1x1m. At this distance all of the trees will grow straight.

His knowledge on this is from school and observation.

No silvicultural interventions are done until the first harvests except pruning.

Harvest will happen gradually, taking out some and therefore giving more space to others that can grow to bigger dimensions now.

### **Interview 21: 06.07 Private planter**

Owns a shop with agricultural supplies, selling seedlings on the porch

- Cypress 50
- E: 50



- Pine 500
- Bush mango 1000
- Coco 300
- Oilpalm 500-750 depending on species

Owens a nursery. Prices are to encourage the people to plant, but it is still a source of income.

Planting important to regulate climate. Pests e.g. blight increased. Rainfall is unregular and sometimes ceasing after planting season, destroying plants. Temperature are rising too. Heavy storms are increasing too.

Vocational training agro pastoral for one year, where he gained all his knowledge. After school he founded a group to encourage innovative farming techniques and activities, including creation of livestock supply, safe use of chemicals or farming of exotic species. Farmers do not pay for his advice.

Food shortage in the region. Climate change are affecting harvests negatively. People are conservative with their techniques and produce little, traditionally for subsistence. Also farming is seen as a poor peasant activity. He encourages the increase of agricultural production and marketing of surplus.

Population size is increasing. People are settling around with the creation of schools. Therefore the farmland became scarce in Mbengwi region. Only few are seriously doing farming. Much of the food is imported, even though there is land. Therefore there is a market. For example. He sold cabbages for 4 000 this morning. One is 150.

Compared to earlier, there are more people now that want to do agriculture, but with the challenges of climate change they do not really know what to do. Even though they might cultivate large portions of land, their crops are often not doing well.

The watershed tree plantings are 1 ha in Bessi, 3 ha in Kai village, 2 ha in Njen, mostly *Maesopsis* and *Pygeum*. Bessi was council land.

He was serving for Anafor. He quit the job because they never paid him. They did not even compensate him for the trees he nursed. He worked from 2011 to March 2013. He applied for a job there. His boss gave him forms to sign in order to be sent to Yaounde as a requirement for his payment. However he never saw money for the whole time.

*Maesopsis* and *Prunus* were chosen because they were available and because they are water friendly.

Some people have nurseries around, which they use to supply their farms. There are big professional nurseries e.g. for E. in Bamenda.

Anafor has two nurseries here in Mbengwi. Last year they raised 65 000 E. there. They were distributed to councils. Some to Njikwa.

On his farm he has *Pygeum* and *Moringa*, both medicinal.

Pepper market is good.

He is cooperating with different farmer groups

He is using maccoting to tree propagation. He would like to use cuttings but he would need to use hormones, which are too expensive.

Checks after planting is 3 weeks after and then 1 month after. It is important to check that weeding and fire traces are carried out. There is pruning of the branches that seem bad, but only the ones that can be reached from the ground, as climbing is risky. When trees reach a certain height the competition will result in natural pruning as branches die off. Higher competition also results on more height growth.

Traditional practices involve not the use of pegging which results in no decision on planting density (1x1 or 1,5x1,5m or 5m is used, but rather randomly) and also complicates weeding as plants are not easy to find. They do not specify plantations, mixing species like E. palms, cassava, plantains and corn. They plant E. in water areas. People plant E. inside their crops.

E. in crops is drying them up.

He does awareness raising by inviting people to see water levels and comparing them to 15 years ago.

E. is the main reason for water scarcity.

Some people want to modify their environment and use the land. They do not care about water scarcity and want to dry up wetlands.

The govt is promising support for reforestation and is doing all to discourage deforestation. On the other hand it is exploiting the lowland forest a lot. Industrial concessions are much more than what the local population is harvesting or using.

Locals need to pay the harvest tax of 1 500 to the council before cutting a tree they planted. In case of non-payment they seize the wood.

People want to harvest, but they don't want to plant. The govt should plant with the money they get from the taxes.

The govt may even allow someone to harvest the trees on your land if you don't have a proper ownership title. This happens in Manfe (SW) and also in Wilikum and Banso in Buy division or Ndonga Mantung.

To promote reforestation, they should do what anafor is trying to do. Encouraging private smallholder plantations, by providing seedlings to plant. They should support them financially for some years to pay for plantation maintenance. Currently you even have to pay the transport of the seedlings. It may even be better to just get the seedlings anywhere for 50 and to just go ahead and plant, because this way you are not registered and the government will not demand the harvest tax.

It's the MINFOF's responsibility to preserve the forest and ensure sustainable management, but he doesn't really see what this ministry is doing. The asked them to apply as organisations if they wanted to get support for planting trees. They did so, but the minfof only selected groups that represented their current political agenda and could thus be instrumentalised in political campaign/ strategy. The distribution of funds is related to lobbying and dependent on political support.

The govt does not control the various efforts it is undertaking. Even the anafor extension worker did not know one farmer in the Mbengwi area as contact was only through Tata. He was the only one to distribute the trees to farmers and to verify plantings and do the follow up. On a higher level there is a lot of laxity.

In rural areas more trees are being destroyed, including rare species. So rural communities need sensitisation in order to preserve biodiversity. This could be done through NGOs that can also identify the endangered trees and have the council impose a cutting prohibition on these species. Getting to these roots is the problem, but it is easier and more cost effective to empower communities to take care of the plants and forests, than to lose or having to restore it.

NGOs are trying their best and are doing better than the govt. The govt however does not seem to value the role and work of NGOs. even though they talk and write a lot they do not support them actively. NGOs also encourage people to plant in showing the potential market for tree products.

Researcher carried out a study on species, including growth characteristics and traditional uses and knowledge. They did not actively encourage tree planting.

For better cooperation a common view is necessary. The different experts should come together and contribute the expertise from their field.

One example for cooperation to foster reforestation would be an NGO supporting community based organisations that in turn serve as focal points for local farmers. Interested farmers can connect with Anafor. One NGO could take charge of supervising nurseries, another could provide financial support, etc.

Herbicides are cheaper, easier and more effective than manual weeding.

The farmers need to see the value of the trees they are planting. If there is no market, or none is perceived by the farmers, the tree loses attractiveness.

Funding for the NGOs and community based organisations could even from the WB or others.

The objective of his group for next year is to plant 30 000 trees as a common initiative. They do not have the land, but other people do. The system is very similar to the anafor, where people apply for planting activities at the council and planting is supervised and followed up by the group. Funding can come from the council and people can pay 25 to 50 per plant.

There is enough land to plant. People's concern in planting trees is that they may not be able to maintain the plantation, especially clearing and protecting it, and the risk that the effort of planting was in vain.

Restoration: bringing back sth back that is not anymore there

Reforestation: planting of trees

Rehabilitation: improving the state of the forest

Planting a watershed is rehabilitation. In general the tree planting activities in the region could be restoration but rather reforestation. The govt is rather promoting reforestation.

## **Interview 22: 07.07 Private planter**

He has been working with ICRAF for an AF project.

E. plantation, first 5 year old, second one last year, he had to replant due to fire casualties. He also planted ornamental trees on the compound. Some planted last year are 2 years old.

He has a plantain farm in the SW.

Ornamental trees are used for fuelwood.

E is used for poles, construction (roofing)

When E. is planted in small distance one is flexible in using it.

If E. is used for roofing planting distance is 2x2, for Poles 1x1. He used 2x2 as he wants to make roofing.

He got the seeds at harvest of older trees >15 years. An adult tree can yield seed for more than 100 000 seedlings.

His ICRAF project started as he had a small nursery for his personal use with Pygeum, Bokanga, etc and he was interested in the expanding to a business. He has always been attached to trees as he was taught about it by his grandfather. Finally he never sold trees but rather distributed them for free, especially the ornamental trees. He is working together with somebody from anafor for the E. nursery. They also distribute seedlings.

They got in contact through friends and relatives and she approach him.

He also does seed collection of the other trees. Seeds should be collected in the middle of the fruiting season and from different sides of the tree. He uses only trees that has been bearing fruits for less than 5 years. Selection of trees depends on the characteristics one is looking for.

Planting distance will determine what a tree can be used for.

Harvest will be done by the buyer.

In his opinion less people are planting trees as they don't yet know the importance. They see it more as a hobby and do not know about the necessity. Interest in planting has decreased the last 20 years, but they are cutting more.

The people neither know the environmental nor the economic role trees can play. They do not want to risk long term investment. They prefer the short term income and see trees as competition for the production of crops. Even if they wanted to plant trees, they would not be able to survive until the benefits from the trees come about.

People that know how to plant trees will not see a competition to other land uses.

For planting, people prefer AF over pure tree plantations. The benefits of timber plantations are abstract compared to AF. The motivation will largely depend on knowledge on species properties and potential benefits.

His grandfather introduced coffee as cash crop and always emphasised the importance of planting trees.

Distribution of seedlings free of charge could promote planting as many people do not even have money to buy seedlings.

Cutting tax does not apply to clearing for agriculture or the removal of old fruit trees. The council will send out officials to follow sounds of chainsaws to collect the cutting tax. Formally one needs to report

the number of trees one wants to cut and pays the council. The controls will usually not reach remote areas.

His work benefits from people acknowledging and encouraging what he is doing. Secondly he is profiting a lot from technical advice on planting and maintenance. He does not choose specific organisations for giving advice, but anyone can come and suggest.

For his AF project Anafor identified the group, Icrat started the project and funded Anafor to follow it up. The ICRAF does not do the follow up because it is not part of their role and the group knows how to work.

The group decided which species to farm, i.e. maize. Only 4 out of 10 group members were interested in planting trees. They have the E. in a different place. They only combine nitrogen fixing trees and crops, e.g. Khalandra.

He is cautious about visitors, because he made bad experience with someone proposing a dubious project trying to screw him.

5 people were planting this year although there are 20 people interested in planting, because there were not enough seedlings of the desired species.

The spacing is very important, however many people are not aware of this.

2 000 or 3 000 per stem for electric poles

A large 30 year old tree can be sold at about 25 000 to 50 000 depending on height.

A good mature tree of 50 years is about 60 000 to 70 000 depending on height

Production of electric poles is popular because they are harvested at a young age.

A log of 4m and mature diameter at 30 years is worth 10 000, but prices vary. One tree can yield 4 logs of 4m

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## Annex 4 : Excerpt from the analysis of questionnaire data

Figure 11: Initial reasons for planting

### Statistics

Why did you plant the trees?

N	Valid	115
	Missing	2445

Valid cases represent the number of responses. Missing cases are due to the data manipulation technique and do not represent invalid answers.

Why did you plant the trees?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	someone else planted	9	.4	7.8	7.8
	watershed/ wind protection	3	.1	2.6	10.4
	securing land	1	.0	.9	11.3
	fruit autoconsumption	11	.4	9.6	20.9
	fruit sale	2	.1	1.7	22.6
	firewood autoconsumption	33	1.3	28.7	51.3
	firewood sale	3	.1	2.6	53.9
	construction	24	.9	20.9	74.8
	autoconsumption				
	construction sale	20	.8	17.4	92.2
	occupying/securing land	6	.2	5.2	97.4
	low soil fertility	2	.1	1.7	99.1
	topography	1	.0	.9	100.0
	Total	115	4.5	100.0	
Missing	System	2445	95.5		
Total		2560	100.0		

All responses are listed here. Rare responses were summarised as other. The graphic was created with Microsoft Word 2010.

**Figure 12: Reasons for not planting more trees**

Statistics					
		MoreTrees	MoreTrees2	WhyNotTree1	WhyNotTree2
N	Valid	90	5	57	16
	Missing	2470	2555	2503	2544

The analysis included frequency tables for the question ” Do you want to plant more trees?” and “Why not?/ Why don’t you do it?”. Maximum valid cases per variable is 90, as the variables are can only occur in one data field per HH in order to be able to correlate them unambiguously with characteristics form the head of the household.

		MoreTrees			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	don't know	1	.0	1.1	1.1
	no, prefer food autosufficiency	15	.6	16.7	17.8
	no, prefer to sell food	1	.0	1.1	18.9
	yes autoconsumption	17	.7	18.9	37.8
	yes sale	17	.7	18.9	56.7
	yes auto + sale	15	.6	16.7	73.3
	no, have enough	17	.7	18.9	92.2
	no, bad for crops/ soil	6	.2	6.7	98.9
	yes, improve soil	1	.0	1.1	100.0
	Total	90	3.5	100.0	
Missing	System	2470	96.5		
Total		2560	100.0		

**MoreTrees2**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no, prefer food autosufficiency	1	.0	20.0	20.0
	no, prefer to sell food	1	.0	20.0	40.0
	yes autoconsumption	1	.0	20.0	60.0
	yes other	1	.0	20.0	80.0
	yes, improve soil	1	.0	20.0	100.0
	Total	5	.2	100.0	
Missing	System	2555	99.8		
Total		2560	100.0		

Responses for "Do you want to plant more trees?" (Not represented in text)

**WhyNotTree1**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no land	45	1.8	78.9	78.9
	no seeds	4	.2	7.0	86.0
	no labour	7	.3	12.3	98.2
	soils are degrading	1	.0	1.8	100.0
	Total	57	2.2	100.0	
Missing	System	2503	97.8		
Total		2560	100.0		



WhyNotTree2		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no land	1	.0	6.2	6.2
	no seeds	10	.4	62.5	68.8
	no labour	4	.2	25.0	100.0
	Total	15	.6	100.0	
Missing	System	2544	99.4		
Total		2559	100.0		

Responses for “Why not?/ Why don’t you do it?” Graphic created with Microsoft Word 2010

**Figure 13 : Species planted by respondents in all 3 villages**

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Village name * What species?	178	7.0%	2382	93.0%	2560	100.0%

Explanations see Figure 7

Village name \* What species? Crosstabulation

		What species?															Total
		Mahogany	Oilpalm	Papaya	Medicinal	Cola	Raphia	Guava	Avocado	Plum	Mangp	Eucalyptus	Malaina	Cyprus	Pygeum	Oranges	
Village	Binka	0	0	0	1	3	1	3	14	2	5	20	0	4	2	3	58
ge	Kikaikom	0	0	1	0	8	0	7	14	1	2	16	0	5	2	2	58
nam	Bamessing	1	7	0	0	0	0	1	8	8	14	15	4	2	0	2	62
e	Total	1	7	1	1	11	1	11	36	11	21	51	4	11	4	7	178

Crosstabulation of Village and species planted. Original Table, for better readability see below

Village name * What species? Crosstabulation					
		Village name			Total
		Binka	Kikaikom	Bamessing	
What species?	Mahogany	0	0	1	1
	Oilpalm	0	0	7	7
	Papaya	0	1	0	1
	Medicinal	1	0	0	1
	Cola	3	8	0	11
	Raphia	1	0	0	1
	Guava	3	7	1	11
	Avocado	14	14	8	36
	Plum	2	1	8	11
	Mangp	5	2	14	21
	Eucalyptus	20	16	15	51
	Malaina	0	0	4	4
	Cyprus	4	5	2	11
	Pygeum	2	2	0	4
	Oranges	3	2	2	7
Total		58	58	62	178

Modified table of crosstabulation (transposed in Microsoft Excel and modified in Microsoft Word for better readability).